第 3 セッション
アジアにおける環境協力とサステイナビリティ
Environmental Cooperation and Sustainability in Asia

Papers & PPT
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第 3 セッション
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Environmental Cooperation and Sustainability in Asia

セッションチェア
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時間がまいりましたのでそろそろ最後の、第 3 セッション「アジアにおける環境協力とサスティナビリティ」というテーマで再開をさせていただきたいと思います。朝からお越しの方々には非常に長時間でお疲れのところでしょうけれども、大変重要なテーマを扱うセッションですので、もう少し我慢をしていただいて積極的に参加していただければというふうに思います。

第 3 セッションは今までのセッションとは方式を変えまして、最初に 3 本の報告をいただきまして、京都大学の植田先生、第 2 報告が Mushtaq（ムシュタク）さんがコペンハーゲンの COP15 に行く必要がございまして、産業技術総合研究所、産総研の小寺さんのほうに第 2 報告をしていただき、それから第 3 報告がインドネシアのバーゼル条約の ASEAN センターの Aboejoewono Aboeprajitno（アブ）さんのほうからしていただきます。

3 つの報告をまずしていただいて、それから 3 人の方、一橋大学の寺西先生、それから早稲田大学の太田先生、それから滋賀大学の田中先生 3 人にコメントをしていただいて、それからパネリスト、それからコメンテーター、フロアも含めた全体の討論を残り 30 分程度で行いたいと思いますのでよろしくお願いします。

【報告】

Rapid Economic Growth and Sustainability in Asia: Making Effective Regional Environmental Governance

「アジアにおける経済成長と持続性:効率的環境ガバナンスの形成」

Kazuhiro Ueta

(Professor at Graduate School of Economics, Kyoto University)

The environmental problems in Asia in the 21st century are emerging with a new quality while the economy and technology are undergoing evolution. This trend is led by regional economic integration through international movement of capital, that is, globalization of the world economy. The global environmental problems since the second half of the 1980s emerged partly due to the globalization. Environmental problems have also changed qualitatively in that they cause adverse effects on a regional scale. Thus we cannot understand the economic mechanism correctly and clarify policy and institutions to manage global and regional environmental problems unless the complex interdependence between the regional and global economies is analyzed. Sustainable development cannot be achieved globally without realizing sustainable society that is endorsed by regional environmental economic policies. To realize sustainable society, it is precondition that environmental right rule should be incorporated into market and global economic system on a global scale. This raises re-examination of the current network between economic activities and environmental policies at a local, regional, national and global economic level.

Asia has suffered from a variety of environmental degradation. At least several problems can be viewed as an emergence of global environmental problems caused by the global economic system. It has been taken up nine phenomena as global environmental problems, namely, (a) depletion of the ozone layer, (b) global warming, (c) acid rain, (d) decreases in tropical forests, (e) desertification, (f) pollution problems of developing countries, (g) decreases of biodiversity, (h) ocean pollution and (i) trans-boundary movement of hazardous waste. This classification is useful in understanding scientific nature of these issues and finding out technical measures to tackle with them. However, it provides little knowledge on how to manage the

environment amid globalization. Economic mechanisms should be clarified to understand root cause of the environmental degradation.

Concerted international action is indispensable for overcoming environmental problems and reducing greenhouse gas emissions in order to create sustainable societies. The key to doing that is pioneering a vision for sustainable development throughout the world, particularly in Asia.

Asia has turned into the world's production base, and its relative importance in the world will become increasingly larger in terms of population, as well as in terms of resource consumption and industrial output. Environmental cooperation is needed to establish a sustainable development pattern in this region.

Our working on solutions for environmental problems in Asian countries and regions will meet and talk with the aim of making their experiences and lessons into the world's common awareness. We must transcend the interests of individual countries and the interests of business, and develop global environmental policy for global environmental conservation. Accomplishing this requires that we identify the conservation-related shared interests of people in the developing and developed countries, and then specify the path leading to the realization of those interests. It is essential that we share environmental and economic information, and achieve communication based on that sharing.

We look for a development model based on sustainability. In various parts of Asia there are cutting-edge initiatives for endogenous development models which, based on local historical and cultural strengths, incorporate environmental conservation into their rules, in other words, sustainable development models that use unique local assets to advantage. Models cultivated in Asia for communities which give people fulfilling lives while reducing greenhouse gas emissions could serve as great encouragement to people around the world.

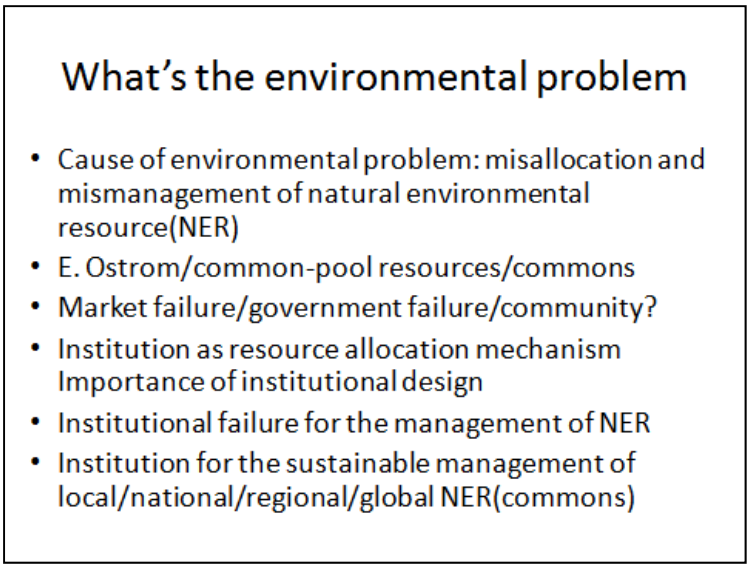
More comprehensive public policy including so-called Green New Deal policy is necessary to revitalize the economy suffered from financial crisis for sustainable development This implies theoretical and empirical research should be developed on multi-level environmental governance to discuss how to realize sustainable development.

【Power Point】

"Rapid Economic Growth and Sustainability in Asia: Making Effective Regional Environmental Governance"

Kazuhiro Ueta

(Professor at Graduate School of Economics, Kyoto University)



Institutions and NER

- Ownership to natural environmental resource
- Private: cultivated land, cattle, oil and minerals
- Communal(common-property): grazing land, threshing grounds, ponds, local forests,・・・
- Open access: atmosphere, international waters
- State: commercial forests, oil and minerals
- State as trustee: national park, cultural monuments
- Institutions: ownership＋α

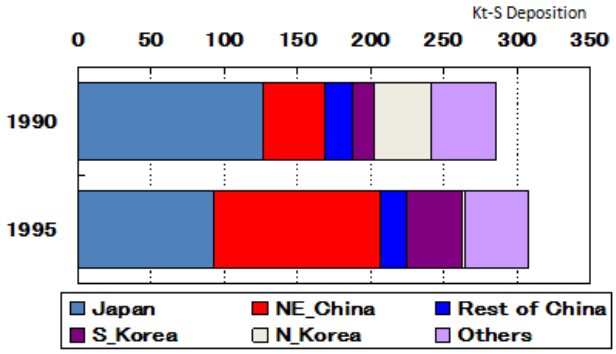
Features and Conditions of Environmental Issues/Governance in East Asia

- Diversity in economic, political, social, cultural dimensions
- Rapid industrialization and high economic growth (catch-up style of development): huge gap
- Public health issue/pollution issue/nature, amenity destruction/global environmental issues
- Local/national/regional/global environmental issues and institutions
- Structure of economic/ecological interdependence: EEL(embodied environmental load), value-added

Local/national commons and institutions

- Almost all countries have institutions/ governmental organizations for environmental policy
- Similarities and differences in environmental policy/institutions
- Japanese experience: local initiative
- Democratic system/NGO for the environment
- More effective environmental governance

Sulfur Deposition in Japan Contributed by Source in 1990 and 1995



Nakata and Ueta (2007)

Regional commons management

- Many pollutants but different characteristics
- Our regional NER is open access NER
- Institutional arrangement is necessary for the management of regional NER
- Interdependence of regional NER/commons with global NER/commons: regional pollutant management issues versus global pollutant management issues such as GHG emission reduction
- Interdependence of regional NER/commons with local NER/commons
- Horizontal and vertical institutional arrangement for the management of regional NER

CO2の収支バランス(1985年)

(Unit: million Ton)

	In	Ma	Ph	Si	Th	Ch	Ta	Ko	JPN	USA	ROW	Total
Indonesia	64.9	0.2	0.2	0.6	0.1	0.4	0.1	0.2	3.5	2.4	3.9	76.4
Malaysia	0.1	20.0	0.3	1.0	0.2	0.2	0.1	0.3	1.4	4.1	8.2	35.9
Philippines	0.0	0.3	22.9	0.1	0.1	0.1	0.1	0.1	1.0	2.4	3.5	30.6
Singapore	0.6	1.0	0.0	7.3	0.5	0.1	0.1	0.1	1.3	1.8	12.5	25.3
Thailand	0.0	0.2	0.0	0.1	35.7	0.2	0.1	0.1	0.8	1.3	8.6	47.2
China	1.7	2.0	1.5	4.1	1.8	1,403.0	0.2	0.3	27.0	23.6	104.0	1,569.2
Taiwan	0.4	0.3	0.1	0.4	0.3	1.2	42.3	0.4	3.1	17.2	14.0	79.6
Korea	0.4	0.3	0.2	0.3	0.2	0.1	0.2	78.2	4.5	13.0	24.8	122.1
Japan	2.7	1.6	0.3	1.7	2.0	14.1	2.7	4.9	810.9	55.6	85.9	982.5
USA	2.5	2.2	0.9	2.3	1.2	7.5	4.2	6.7	30.6	4,427.6	332.3	4,818.0
Total	73.3	28.2	26.4	17.9	42.1	1,426.9	50.0	91.3	884.0	4,548.9	597.7	7,786.8

CO2の収支バランス(2000年)

(Unit: million Ton)

	In	Ma	Ph	Si	Th	Ch	Ta	Ko	JPN	USA	ROW	Total
Indonesia	184.1	2.3	1.2	2.1	2.0	5.0	2.8	3.9	15.9	19.4	52.9	291.6
Malaysia	1.1	46.8	1.1	4.6	1.8	4.5	2.3	2.1	11.4	22.5	48.0	146.2
Philippines	0.1	0.3	49.1	0.2	0.3	0.8	0.5	0.5	3.4	8.0	12.9	76.0
Singapore	0.5	1.8	1.1	19.7	1.0	2.5	1.2	0.9	2.4	5.1	35.0	71.2
Thailand	0.7	1.2	0.5	1.2	103.7	2.5	1.2	0.9	7.8	12.6	42.0	174.3
China	4.6	4.8	1.9	5.3	6.2	2,466.4	9.9	19.5	104.3	198.5	399.4	3,220.8
Taiwan	0.8	1.1	0.6	0.6	1.3	14.2	143.0	1.5	8.3	20.1	56.2	247.7
Korea	1.9	1.2	1.3	1.0	1.3	19.5	4.0	356.2	18.3	28.7	103.3	536.8
Japan	1.3	2.1	0.8	1.9	2.4	8.4	5.1	4.9	919.1	34.1	70.4	1,050.6
USA	1.9	2.8	1.6	2.9	3.0	13.1	10.4	12.0	43.0	5,448.3	518.5	6,057.5
Total	197.1	64.5	59.2	39.5	122.9	2,537.0	180.3	402.6	1,133.8	5,797.2	1,338.7	11,872.8

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Multi-level Environmental Governance for Sustainable Development

- Control of economic/ecological interdependence
- Global/regional/national/local commons
- Who should pay for the management of regional natural environmental resource
- Institutions for the regional cooperative approach for win-win and equitable strategy
- Asian environmental agency for the common knowledge/information and research

【報告】

Regional Environmental Cooperation and Environmental Technology in Asia

「アジアにおける環境協力と環境技術」

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Contents

1. Outline

Integrated solid waste management is one of the important infrastructures of societies in any countries. Integrated solid waste is a mixture of various types of wastes, which generate in waste sources of households, shops, restaurants, factories, agricultural facilities and other places where human activities are in progress. With economic growth in developing countries, the local governments and communities are required to establish waste management systems, which would lead the heavier duty and cost to them.

Waste treatment traditionally aims public sanitation. Putrefactive wastes such as kitchen wastes are to be thermally treated to prevent harmful creatures and diseases. Suitable treatments of hazardous wastes are also required for public safety and human health. On the other hands, wastes of metal and glass are often separated from mixed wastes either by licensed waste management sectors or informal individuals in streets

and waste collection yards. In both case, separation of some types of wastes brings them economic benefits. Recovery and utilization of resources from wastes generating in the local communities are of importance with respect to the cost reduction of waste management and the reduction of the environmental impacts by improper manners or even conventional methods of waste treatment.

UNEP Governing Council (GC 25/8) acknowledges the role of UNEP-DTIE-IETC and requests the Executive Director of UNEP to provide further assistance to developing countries in their efforts to strengthen national implementation of an Integrated Waste Management approach. Furthermore, the Bali Declaration on Waste Management for Human Health and Livelihood (Annex 2) reconfirms this decision. Moreover, UN Commission on Sustainable Development (CSD) has also agreed to undertake waste as one of the focus areas for CSD18. Among various schemes for the partnerships with developing countries, one of the key issues is the transfer of environmentally sound technologies (ESTs) to suitable area. The UNEP activities on technology transfer and technical guidelines are in progress in the fields of integrated solid wastes, E-waste management, biomass utilization and waste plastics conversion across the fifteen countries in the Asia Pacific region.

2. Framework of ESTs transfer

For ESTs transfer to be effective under limited resources, knowledge of technologies, methodologies of technology selection and surveys on the social conditions of developing countries are integrated on human networks of practitioners, technology providers, scholars, citizens and decision makers in developing and developed countries. Figure 1 shows an example of the ESTs transfer mechanism. Some are currently implemented and some are planned for the next stages.

In the conventional technology transfer to developing countries, a technology provide often with a business consultant promote their business in developing countries. The technology provider would carry a certain technology, which helps enterprises or public organizations in their communities and countries. However, they are always with some risks in the selection of appropriate technologies due to the limited opportunities to compare the other technologies and limited technical knowledge. Even in developed countries, any business has risks in the right selection and effective operation of technologies in a suitable system and business model under the given business environments such as business partners, local laws and regulations, economic conditions, human resources and the other factors at present and in the future.

There are many types of human resources in developed countries. Generally, they work for their own purposes – for example, economic benefits for their companies, his

academic interests, and development of his nation. Based on a noble policy, clear visions and firm will are required to plan and implement a sustainable or practical waste management program for developing countries. International organizations should play a role in showing the current conditions of developing countries to the people in the rest of the world and stimulating public opinions to form effective networks of international partnerships across each participating countries. Additionally, international organizations of governments and non-governments can demonstrate mutual benefits of the people in developing and developed countries more clearly in the views of an international trade of environmental technology – economic benefits of individual technology providers and clean development mechanism – greenhouse gas reduction of a nation.

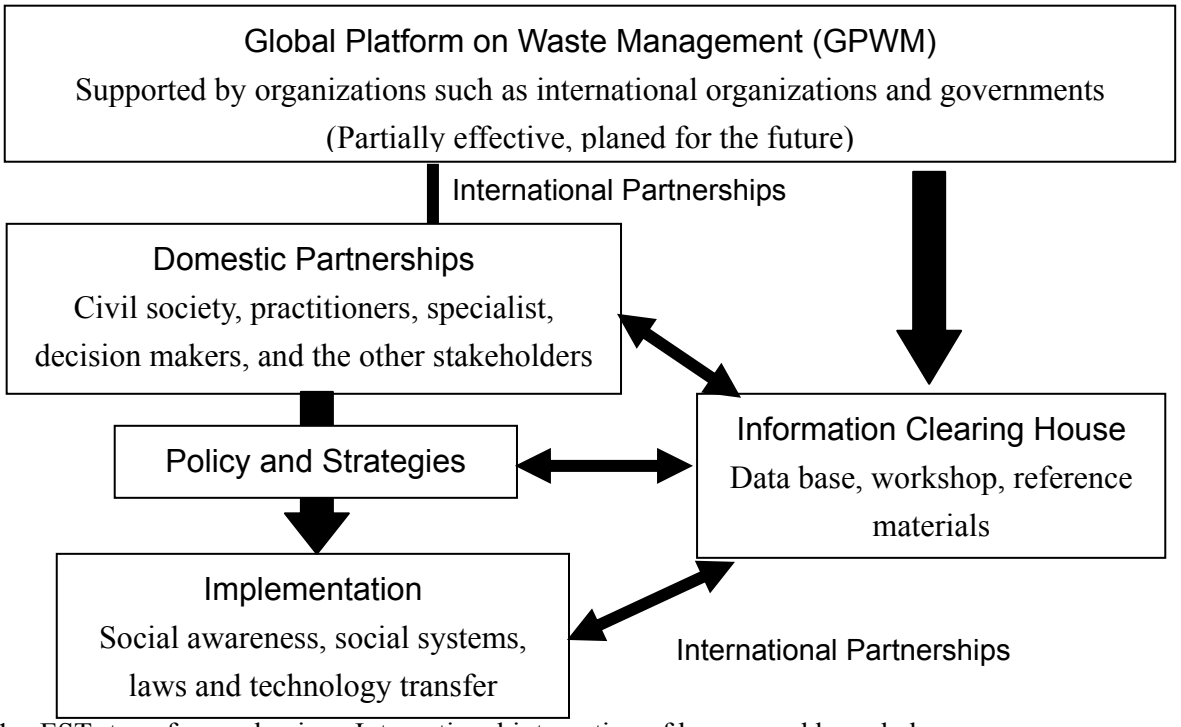


Fig. 1 ESTs transfer mechanism: International integration of human and knowledge

As a part of the Global Platform on Waste Management (GPWM), UNEP-DTIE-IETC organizes scholars, researchers, technology providers and practitioners in the fields of E-wastes, biomass and waste plastics. Some scholars and researchers especially in the field of technology have limited knowledge in the local conditions of developing countries. Different from industrial products like cars and electric appliances, the most types of technologies and systems for waste management can be sustainable under the limited conditions from the social or economic views. Thus, various participants of developing countries are also needed to report on the local conditions to technology providers and specialists for discussing guidelines to select

technologies with considering scope and limitations of the technologies. Scholars and researchers in social studies and economics, officials of local governments, and practitioners from developing countries are the important part of GPWM.

3. Process of technology selection for developing countries

3-1 Preparation of a compendium of technologies

A primary step of technology transfer is to review current technologies for the purposes, targeted wastes or planning methods. There are many conventional equipment and systems, which are already out of date, currently available, or under development. For the case of a current project on waste plastics conversion into resources, fuel production technologies are gathered based on a proposal by UNEP-DTIE-IETC.

An author or authors are chosen by surveys of literatures, books and interviews at the points of active, cooperative attitude, the wider view of technology and the socioeconomic backgrounds for sustainable technologies. The author gathers a wide range of technical information under the cooperation with technology providers. The technologies can be commercial or under development.

The technology compendium should include target materials, products, scientific fundamentals of processing, engineering of equipment, specifications (energy consumption, size, treatment capacity or performance) and utilities. Cost-related issues such as plant price and maintenance cost will be estimated in detailed discussion between technology providers and an operation sector at a stage of screening technology or examining a demonstration plant.

3-2 Preparation of the reports on the local conditions of developing countries

Some types of wastes of metal, glass, biomass and plastics can be considered as potential resources. The following data are required to plan possible schemes of wastes treatment projects including recycling; the properties and amounts of wastes, types and locations of waste sources, conventional treatment methods, and waste management companies, if possible, involving informal waste collection. A type of waste conversion technology is determined by waste composition, and a facility scale is determined by collection amounts of target wastes in a designated area. When the profits by sales of recycling products and waste disposal charges can cover the cost for producing recycling products, waste recycling business can be established to give the economic benefits with reduction of waste disposal amounts.

3-3 Expert workshops

Expert workshops are held to know scope and limitations of technologies and to understand the social conditions of developing countries, especially, waste management

system of generation, collection and treatment. In a technical session, balanced participants from academic, technology providers and practitioners of waste management are required. It is important to clear the target waste of the current technology and the governing factors of economic feasibilities of the commercial system for the wastes. For waste conversion to produce a recycling product, e.g., fuel from biomass or plastics, quality of the product and expected users are to be presented.

There are many elements to form individual technology, facility, business models and business environments for feasible waste managements. The participants in the workshops share their research results, experience and opinions on those elements for selecting suitable technology or system in order to improve the environments and economics of the wide varieties of local societies in developing countries.

3-4 Local training workshops

There are various stakeholders in management and recycling of wastes – waste generators, management sectors, recyclers, local residents, local governments and taxpayers. The members and the contents of workshops would be varied depending on the nature of wastes, products and business; waste sources, hazardous/non-hazardous, material types, public service or private business. Local training workshops can be held for any stakeholders on a specific project, or general themes on the related issues of technical, economic and social topics.

For waste plastics conversion into resources, typical themes in the local training workshops are demands of recycling products in local societies, technical and economic feasibility of waste plastics recycling, and the necessity of recycling comparing with conventional treatments. The opinions in the workshops would be valuable for any participants. Decision makers and project planners could obtain human networks of knowledge and experience, which lead to selection of suitable technologies and reasonable decision.

3-5 Decision-making and B-to-B processes

Decision-making in launching a project and selection of technology is made by the authority in a local company, community or government in its own risks. Prior to launching a commercial project, a pilot project using a bench plant and demonstration plant should be considered. The results of the pilot project is carefully evaluated in both technical and economical viewpoints, and the equipment and system will be modified if necessity under the intensive discussion between project participants and technology providers.

Assessment of technology and a whole project is required for the final selection of suitable equipment and system and for implementing the operation of waste

management. Sustainable assessment of technology (SAT) is proposed by UNEP-DITE-IETC and the Global Environment Centre Foundation (GEC). It provides a strong tool for assessing ESTs at the points of soundness and feasibility of technology, environment and business in the local societies of various countries.

Appropriate selection of ESTs and sufficient financial investments are followed by business-to-business partnerships to initiate a commercial (and sustainable) operation of the environmental technology by the people in developing countries.

4. Sustainability assessment of technology: Key tool for technology selection: Proposed Framework for Sustainability Assessment of Technologies

A. Objectives

The objective of the methodology is to encourage customization, expression of local interests, and also to take into consideration technological, economic, social and environmental perspectives. Thus, the methodology may be viewed as a multi-criteria approach to facilitate informed decision-making. The eventual goal is an EnTA framework that will facilitate an objective, unambiguous and transparent decision-making in EST selection.

However, the methodology is not expected to serve as a black box or an automated system that will provide a technology choice as a ready-made output. Instead, the focus here is on the process, which is viewed to be as important as the outcome.

B. Target users

The new methodological framework for SAT is proposed with the premise that it will be used by a varied group of stakeholders in different scenarios and at different levels of decision-making.

At the policy / government level it can be used for strategic decision-making. These strategic level decisions are made by planners, civic body officials and mayors /elected representatives, who might use the SAT framework and methodology for this purpose. Once decisions at the strategic level are finalized, the next step involves a rigorous SAT at the operational level primarily by the technical / engineering staff, designers, and consultants to assess individual technology options.

Secondly, communities and industrial clusters can use the SAT framework and methodology as well - for instance, when they are building centralized water or wastewater treatment system, or a recycling facility. The managers and members of the industrial cluster need to understand the techno-economic and environmental aspects of the technology choices in order to arrive at a decision in a multi-stakeholder setting. The SAT framework and methodology (including the participatory decision making

process) facilitates such a decision-making.

Thirdly, individual hamlets/villages and enterprises can also use the SAT framework for objective and informed decision making by comparing a number of available options for sanitation, water supply or manufacturing.

Finally, target users could also include financing institutions, which play a role in funding technology interventions.

C. Key elements of the proposed SAT framework

C-1. Application on a system scale

The existing EnTA methodology has been designed for the application at the enterprise level and can be used for the assessment of individual technologies, i.e. for a particular unit operation. However, the methodology proposed here is structured to assess a system of technologies, where a system may comprise of a number of individual technologies. This is a very important consideration in real life situations, where in most instances it is a technology system consisting of a number of individual technologies - as against the lone technology solution - that is adopted.

For instance, a wastewater treatment technology in reality comprises of a number of technologies / unit operations each of which is dependent on the other for the treatment process to be effective. While individual technologies can be assessed objectively, in most situations, they behave differently in conjunction with the other technologies when they are part of a system. The proposed methodology recognizes the interdependencies within technology units by putting an emphasis on the system rather than the individual technology.

C-2. Consideration of strategic as well as operational level assessments

Since the EnTA approach is restricted to the operational level by and large, strategic level considerations were not included explicitly in the methodology. However, strategic considerations are important as these encourage a focus on situation analyses, thus discussing broader issues such as institutional, financial, policy/planning related aspects, rather than the technology alone.

As an outcome of this exercise, a plethora of relevant technologies/systems could be considered for subsequent operational level SAT. The proposed new methodology has thus incorporated the step of strategic level assessment as the important precursor for the actual SAT.

C-3. Restructuring criteria and indicators

The criteria and indicators are probably the most important elements of the SAT process. As such, the structure of the EST criteria proposed by UNEP and GEC have been extensively reviewed and suitably adapted to overcome the current shortcomings.

Thus, in order to develop more robust sets of criteria and indicators, the following aspects have been taken into consideration:

- Criteria and indicators proposed under the SAT methodology by UNEP and GEC
- Parallel approaches like the World Bank s Input-Output-Outcome-Impact (IOOI) systems, as well as aspects such as indicators for Risks and Restrictions followed by the Organization for Economic Co-operation and Development (OECD)
- Life cycle perspective

In order to develop the specific criteria and indicators for a particular scenario or application, a methodology as depicted in Figure 2 could be deployed.

Figure2: Developing Criteria and Indicators for a Scenario

Organizing stakeholder / expert workshops for brainstorming on the generic and specific criteria is a critical step and should be carried out to seek opinions and debate on possibilities to arrive at a set of criteria and indicators on the basis of a consensus. Refer to annex * for the list of participants of a workshop conducted

C-3.1 Categories used

Considering the above-mentioned aspects, criteria and indicators were developed for the new methodology under key categories such as:

- Technological suitability
- Environment (in terms of resources and emissions, risks etc.)
- Economic / financial considerations
- Socio-cultural aspects

Specific criteria and indicators have been developed under each key aspect. The proposed new methodology thus includes new sets of generic criteria and indicators, supplemented by sector-specific1 criteria and indicators. The generic criteria and

indicators have been developed keeping in mind situations most likely to arise while assessing EST systems.

However, it should also be noted that these generic criteria are indicative and that it is also possible (and indeed even recommended) to develop customized criteria and indicators depending on specific situations. The list of generic criteria and indicators has been presented in Table 2.

C-3.2 Participatory stakeholder component

It is further recommended that developing new criteria and indicators for specific situations of SAT should be done by a team representing the various affected stakeholder groups, preferably under the guidance of neutrally placed or unbiased subject experts. This can ensure that the views and interests of all stakeholder groups are incorporated in the SAT exercise.

With a group of stakeholders from diverse backgrounds and expectations, it is entirely possible that the discussions may not always remain focused and consequently may miss out on some of the most important considerations and criteria. It is therefore essential to systematically steer this criteria development exercise within a given framework and scope. A good moderator/facilitator may organize a brainstorming discussion within the framework of above-mentioned aspects to seek the participation and diverse inputs from all stakeholders, and steer the thought process in the right direction to ensure the desired outcomes.

C-3.3 Framework for developing new criteria

While developing new criteria and indicators, considerations about (1) IOOI and (2) additional considerations can greatly facilitate a focused discussion process while ensuring that no important issues are missed out.

IOOI framework

Includes inputs, outputs, outcomes and impacts of a technology. An illustration is provided below. Let us consider, for example, a technology to control air emissions from diesel buses. The needs assessment will specify the following input indicators (technology-specific resources to be provided), output indicators (to measure goods and services produced), outcome indicators (to measure the immediate results of the project), and impact indicators (to monitor the longer term results);

- Inputs: Costs, technical inputs such as diesel, water, oil, manpower etc.
- Outputs: emissions from the engine, mileage derived using the technology
- Outcome: reduced PM-10 emissions from buses
- Impact: reductions in ambient concentrations of PM-10 in the central city, or reduced health problems from respiratory diseases. Life cycle considerations are

important while considering impacts of a technology choice, that address phases of a technology other than its useful life (such as procurement of resources, closure / abandonment)

Additional Considerations

Further, in any decision-making process, special attention needs to be given to the risks and restrictions associated with each choice, since these become crucial deciding factors in many instances. Typically, risks and restrictions that need to be considered in making the technology choice include:

- Stability
- Flexibility
- Hazard
- Size/scale of operation
- Adaptability
- Skill levels needed
- Any other pre-requisites (such as availability of space, etc.).

Outcomes of the strategic assessment exercise

Last but not the least, it is important to note that the outcomes of the strategic assessment exercise - viz. the objectives and targets of the technology system intervention must also be considered while developing new criteria and indicators, as they can serve as excellent pointers for the same

To sum up, in order to systematically devise a set of criteria and indicators for the assessment of a set of technologies, it is essential to understand the entire life cycle of technological intervention by looking at the inputs (quality, quantity of raw wastewater, energy, manpower, space requirements, financial inputs etc.); the process itself (energy, manpower, operational expenses etc.) as well as the outputs (quality of treated wastewater, quantify of sludge etc.). In addition to inputs and outputs, one also needs to consider the broader objectives of technology interventions by scrutinizing the outcomes and impacts at the strategic level. Other considerations (including societal considerations) can also provide some important pointers in developing new situation-specific criteria and indicators.

C-4. Setting out a tiered process

A tiered approach is efficient, as it does not require exhaustive data collection for all the technology or system options. Users can eliminate the obviously non-feasible options at an early stage, and then focus on select qualified options. In this way, detailed information collection becomes essential only for short-listed options, thus saving substantial time and effort.

Arriving at the final choice from a number of available options can be done in two ways:

- Eliminate the unwanted n options to arrive at the best option A.
- Supersede / rank the available options in the order of priority to arrive at the best option A.

The proposed methodology uses both the techniques. Firstly, with the logical (Yes/No type) EST criteria, the available technology options are screened. Only qualified ESTs are subjected to further assessment, while others are eliminated.

The ESTs that pass through the screening stage are then subjected to a second round of elimination with the help of some select criteria. These criteria could use more of qualitative or readily available quantitative information in order to rate the indicators. In doing so, a number of unqualified options are likely to be superseded, thus leaving the users with a limited number of candidates EST options. These are then subjected to very rigorous evaluation using additional criteria requiring a greater extent of quantitative information. As explained earlier, the criteria to be used at this level must be chosen/ developed by the stakeholders from the generic list and governed by the local context.

C-5. Decision-making tools

The current EnTA methodology relies on a number of tools and techniques while arriving at the decision. These tools include:

- Information driven benchmarking
- Expert opinions
- Participatory assessment by stakeholders

The new SAT methodology uses the same tools - albeit with a difference, which is noted below in the explanation for computational methods.

C-6. Computational methods

In the proposed methodology, tools and methods have been chosen to facilitate objective decision-making while overcoming the limitations of qualitative assessment. The key elements here are:

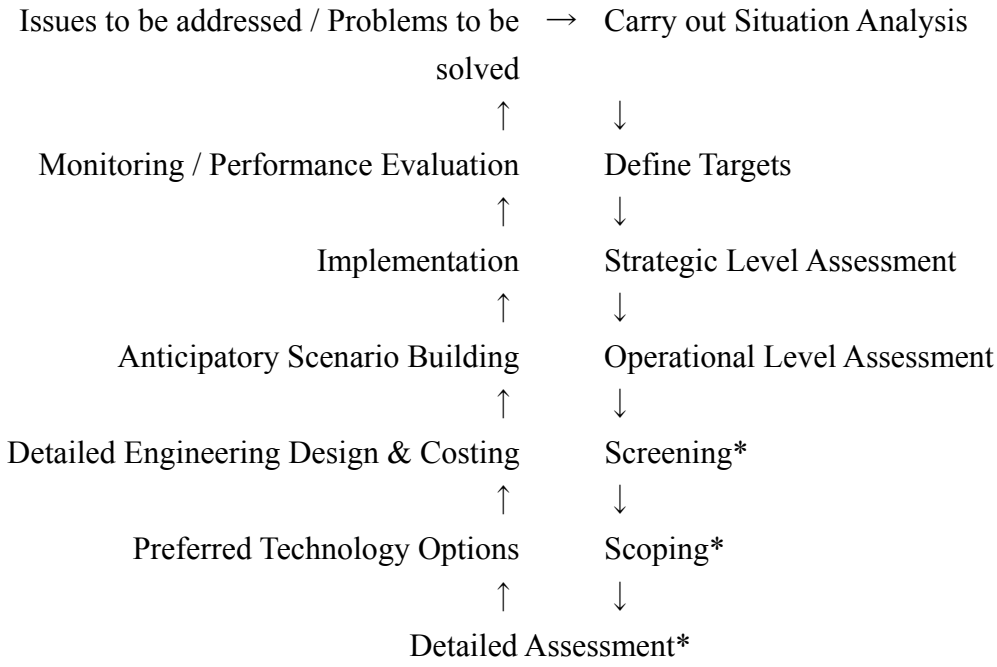
- Weights to be assigned to criteria
- Scores that will need to be assigned to indicators

Depending on the complexity and sensitivity of the decision to be made, as well as the competence and the capability of the user groups, a range of assessment techniques can be applied. These range from a simple Weighted Sum Method to more complex rational approaches such as Analytic Hierarchy Process (AHP) and can be used selectively depending on the specific needs and situations.

D. Proposed generic methodology/decision making process for SAT

Based on the preceding discussion, the following methodology for SAT is proposed (Figure 2). A brief explanation to the various steps follows.

Figure 2: Proposed SAT Methodology assisted by Public Information / Consultation



*Customized criteria and indicators considering Environmental, Social and Economic considerations

D-1. Problem definition / situation analysis

The purpose of technological intervention is to address some problem, such as solid waste management in a city or establishing a centralized wastewater treatment plant in an industrial cluster. Once the problem is thus defined, it is essential to undertake a detailed situation analysis. This will include additional data collection, public consultation process and other socio-economic surveys and studies as necessary. A situation analysis becomes a foundation to the strategic level assessment. It also helps in setting the targets that should be addressed by the proposed technology intervention.

D-2. Strategic level assessment

In the first tier of assessment, macro-level planners, decision-makers, ministers /mayors, elected representatives should brainstorm and study various options at the strategic level. Strategic level assessment should lead to a customized list of criteria and

indicators (possibly with weights across criteria) from a generic list (see Table 2). This adaptation should reflect the situation analysis, sector characteristics (e.g. water, sanitation, solid waste, wastewater etc.) and important scenarios (e.g. future population growth, changing waste composition, etc.). Box 1 summarizes some important pointers with regard to the strategic level assessment. In this level the involvement of key stakeholders is the maximum, where as expert opinion and technology information are important in that order.

Box 1: Strategic Level Assessment of EST Options

As a precursor to SAT, it is essential to conduct the evaluation of available technology options and associated requirements at the strategic level based on a situation analysis. This can be better explained with the help of an example.

Let us consider a scenario where a city administration is making significant infrastructure investments to address the problem of wastewater management. For this purpose, a thorough situation analysis is carried out based on master plans, additional data collection, public hearings, etc.

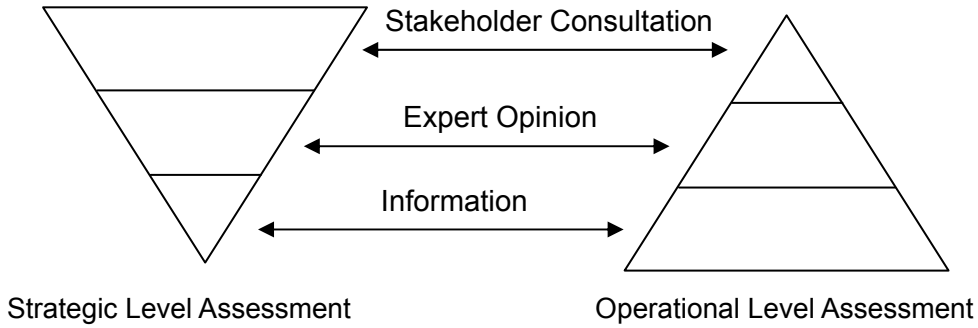
Based on this study, there could be a number of choices at the strategic level in line with the objectives. For example, the objective of the technological intervention in this case could depend on matters such as the possible recycling of treated wastewater in view of severe water shortage, space constraints, etc. The key decision at the strategic level is likely to include a choice between centralized treatment systems versus decentralized treatment systems, each category possessing some number of technology systems for consideration.

The decisions could be governed by the available budget, the level of service required to be provided (based on the paying capacity of the users), receiving body considerations and a plethora of other factors. In addition, socio-political considerations are also bound to influence such a decision. Such decisions at the strategic level are generally made by planners, civic body officials, mayors or elected representatives.

Note that it is not possible to prescribe any standard methodology for such a strategic assessment as it will indeed depend on the local context which differs from case-to-case. However, to facilitate such decision making, in addition to expert opinions and techno-economic feasibility studies, one may also use planning tools such as Participatory Project Planning (PPP) using vision mapping, logical framework analysis, etc.

It is important to note that the decision at the strategic level is the critical factor in the subsequent identification of candidate technology system options. These system options will then undergo assessment at the operational level.

Figure 3: Tools used in Strategic and Operational Level of SAT



As shown in the figure above, the tools used in SAT (stakeholder consultation, expert opinion and information) at the strategic and operational levels vary in terms of their sequence and extent of application.

D-3. Operational level assessment

Once the macro-level or strategic level options are finalized, the SAT moves on to a more operational level where engineers, technical staff etc. take over to assess the available EST systems. In case the SAT is to be carried out only at a community or enterprise level, the earlier stage of strategic assessment may be skipped and stakeholders can start with the operational level SAT as the first step. The levels of expert opinion and technology information are the highest in this level.

D-3.1 Participatory process

Like in the case of strategic assessment, it is recommended that this stage of SAT should also be conducted by a stakeholder group. While this participatory process can ensure that due consideration is given to the concern of each stakeholder, the entire process can be moderated and facilitated by technical experts, which will also bring in the element of expert opinion. Moreover, the expert should share the available technical information so that the entire discussion is information driven to the extent possible, thus minimizing subjectivity and ambiguity.

D-3.2 Identifying technology system options

Based on the problem definition, situation analysis and the outcomes of strategic level assessment, a basket of potential technology systems should be identified, which will be subjected to further rigorous three-tiered assessment. This initial exercise too, must be done with the help of expert opinion. Reference can be made to available

technology fact-sheets, case studies and other available information resources such as UNEP's ESTIS or other environmental technology databases.

D-3.3 Selecting the criteria

Depending upon the specific situation and needs, the stakeholder group may like to adopt the proposed set of generic and/or sector specific criteria without any changes. As noted earlier, in some situation-specific cases, it may be essential to revisit the generic set of criteria, and modify or add some specific criteria. The criteria are selected through stakeholder consultation and agreement.

D-3.4 Screening tier (tier 1)

At this stage, the short-listed system options first undergo screening using criteria in tier 1. The tier 1 criteria yield only an objective Yes/No type answer and hence, those options that do not qualify one or all the conditions, then get automatically eliminated. For example, one of the criteria in tier 1 relates to a very basic requirement - legal compliance. In case a technology system can not ensure legal compliance, then it would get eliminated at this point itself. This assessment can be done by a suitable stakeholder group with / without the help of expert opinion.

D-3.5 Scoping tier (tier 2)

Short-listed system options from the tier 1 then go through the comprehensive scoping assessment (tier 2) that is more of qualitative in nature (low / medium / high). During this stage of SAT, the stakeholders are required to assess the various technology system options vis-à-vis the generic and customized criteria and indicators using any of the listed computational methods (preferably the simple weighted sum method) by following the steps as described below:

It is important to note here, that the scoping exercise lends an advantage in narrowing the decision range of scores, for a particular criterion in the detailed assessment level. For instance if low / medium / high scores are assigned on a basis of a scale of 0-10, then a selection of medium score would scope the scores between 4 and 6. This allows a better sensitivity analysis to be carried out.

D-3.5.1 Weighted sum method

As one of the simplest methodologies for assessing alternatives, the weighted sum technique has been widely and effectively used in various applications.

The Weighted Sum Method is a quantitative method for screening and ranking available technology options against the recommended criteria. This method provides a means of quantifying and emphasizing the important criteria over the others. This methodology is described in detail in subsequent sections, with relevant examples.

In situations where alternatives cannot be objectively assessed with ease and need a

subjective or expert opinion based approach, weighted sum technique could pose some hurdles in decision-making. In such cases one can resort to other and more complex techniques under what is collectively known as 'Multi Criteria Decision Making' Approaches.

One such technique, the Analytical Hierarchy Process (AHP), is explained in the next section.

D-3.5.2 Analytic Hierarchy Process

Multi Criteria Decision Making (MCDM) is often a challenging process and different techniques have been tried out till date.

While making decisions involving a variety of tangible and intangible strategic goals, managing conflicting stakeholders, or selecting from among dozens of alternative technology options, the Analytical Hierarchy Process (AHP) can help managers and developers combine all of this information and make informed decisions.

One of the reasons for AHP s popularity is that it derives (presents) preference information from (to) the decision-makers in a manner that they find easy to understand.

AHP is a systematic and structured procedure to construct and represent the elements of a problem in a hierarchy format. The basic rationale of AHP is organized by breaking down of the problem into smaller constituent parts at different levels. Decision-makers are guided through a series of pair wise comparison judgments to reveal the relative impact, or priority of the elements (e.g., criteria, alternatives) in the hierarchy. These judgments in turn are transformed to ratio-scale numbers representing relative weights of the elements at a certain level of the hierarchy, as well as globally.

The hierarchy in AHP is often constructed from the top (goals from the management standpoint, e.g., environmentally-sound development), through intermediate levels (criteria on which subsequent levels depend, e.g., physical, chemical, biological, and socioeconomic criteria) to the lowest level (usually a set of alternatives, possible actions). AHP allows the combination of group judgments by taking the geometric mean of single judgments.

One of the software applications that uses the AHP technique to carry out MCDM is Expert Choice (available at http://www.expertchoice.com).

Expert Choice provides an interface that guides the stakeholder group through the process of:

- Structuring decision into objectives and alternatives
- Measuring objectives and alternatives using pair-wise comparisons
- Synthesizing objective and subjective inputs to arrive at a prioritized list of alternatives thus eliminating the need for complicated mathematical / numerical

calculations

- Incorporating sensitivity analysis and expert opinions to overcome subjectivity
- Reporting decisions with a documentation mechanism
- Allowing participatory assessment by stakeholders

Assigning weights against each criterion

While a basket of generic as well as sector specific SAT criteria has been proposed in the new methodology, not all may be of equal importance in the process of decision making. Depending on the specific situation, conditions and priorities some criteria become more important than others for that particular case. Weighted sum method captures such a scenario by assigning weights to different criteria in accordance with their relative importance in the given context.

Let us consider a simplified example of a solid waste management project where technology system options are being assessed against the criteria such as costs (capital plus operating and maintenance costs), space requirement, energy consumption (and hence greenhouse gas or GHG emissions), and acceptance by affected communities. Different stakeholder groups may have different opinions about the relative importance of each of the criteria. For the concerned government agency overseeing the project, costs and space requirement may be of prime importance, while neighboring communities may place emphasis on the acceptance of the technology system. Environment groups / NGOs may be more concerned about aspects such as energy consumption and GHG/pollutant emissions. How does one assign the weights to different criteria in such a case?

Firstly, the moderator can go round the table and try to build consensus for arrange the set of criteria in order of priority (rather than straight away assigning the weights). Once the relative importance of the criteria is established, the group can then move to assigning weights for each criterion.

There is no standard formula for assigning weights to criteria rather, it is to be done within a group setting with a participatory flavour. The group may decide weights on a scale of 0-10 or 0-100; there is no hard and fast rule concerning this.

In such situations however, groupthink can occur. For example, the eccentric views of charismatic or even outspoken speakers can get undue prominence as the group seeks to make a decision by consensus, thus leading to poor decision making. Techniques like the Delphi Method can be applied in such situations to reach a properly thought-through consensus among stakeholders. Box 2 describes the Delphi method for consensus building, which may be used in this exercise.

Box 2: Delphi Method for Consensus Building

The Delphi Method works through a number of cycles of discussion and argument, managed by a facilitator who controls the process, and manages the flow and consolidation of information. Following are the steps for consensus building using Delphi:

1. Clearly define the problem to be solved (in our case, assign weights to the criteria)
2. Appoint a facilitator or chairperson with the skills and integrity needed to manage the process properly and impartially (the rest of this process assumes you are this person)
3. Select a panel of stakeholder with the depth and breadth of knowledge, and proven good judgment needed for effective analysis of the problem
4. Get individual panel members to brainstorm about the problem from their point of view and provide feedback to the facilitator, anonymously
5. Facilitator consolidates the individual responses, and resubmits these to the panel. 6. Now resubmit this summary information to the group and get new responses. Some individuals may change their mind and may decide to go with the majority. In other cases, those who are not with the group decision may provide some new information which may influence the group decision in the next round.
7. This process continues until a consensus on alternatives has been reached. (For instance, 70% participants may agree that social acceptability is the most important criteria and should be assigned a weight of 7 on a scale of 0-10).

Preparing the weighted sum matrix for the selected options using the relevant criteria

Once the weights have been assigned for each criteria, each available technology option is to be rated against each criterion using a scale (say) of 0 to 10 (0 for low and 10 for high). Again, there is no golden rule in this regard.

In the criteria table provided in Table 2, the responses (scores) for tier 2 criteria are in the form of the "High / Medium / Low". It is essential to change this qualitative information to numbers. For this, the group may agree to some guidelines such as for "low" assign a score between 0-4, while for "medium" it could be between 4-7 and 8-10 for "high". This also has to be decided through a group consensus.

Finally, the rating of each option for a particular criterion is multiplied by the weight of the criterion. An option's overall rating is the sum of the products of rating times the weight of the criterion.

A matrix of criteria vis-à-vis available technology options using the weighted sum method as described above can be prepared. A template for developing such a matrix is shown below in Table 1.

Table 1: Template for computation using the weighted sum matrix method

Criteria	Weight	Tech System A		Tech System B		Tech System C	
		Score	Weight × Score	Score	Weight × Score	Score	Weight × Score
Criteria 1	W1	A1	W1 × A1				
Criteria 2	W2	A2	W2 × A2				
Criteria 3	W3	A3	W3 × A3				
Criteria 4							
. . .							
TOTAL							

Scores can be assigned on the basis of a predecided scale. Actual information on a particular criterion could be qualitative or quantitative and will have to be converted to a score on the basis of the sale assumed.

Note: It is critical here to decide consistent descriptor definition for the scores. That is, whether a higher or a lower score is better and desirable for qualification.

In most cases, the weighted sum method can provide satisfactory results. It is recommended that Expert Choice be used for more complicated and/or high value decisions. Expertise in the use of the software is also a prerequisite, in addition to the licensing fees.

D-3.6 Detailed Assessment Tier (tier 3)

As an outcome of the scoping exercise, a number of non-feasible or unqualified EST options would be eliminated and the options with the best overall ratings are thus selected for further detailed (tier 3) technical and economic feasibility. This level of assessment is rather situation-specific and the suggested criteria at this stage demand a lot more detailed and quantitative information to facilitate decision-making. Using the information, the stakeholder group should once again prepare a new weighted sum matrix or revise the existing one. In some instances, it is possible that the rating of the technology systems may change due to the new scoring based on available information. As an outcome of this exercise, the group will get a number of technology system options ranked in the order of their scores or in other words their performance vis-à-vis the principles of sustainability.

D-3.7 Sensitivity analysis

In the process of developing the weighted sum matrix, it can be seen that at times the difference between the total scores for some options may be very marginal. In other

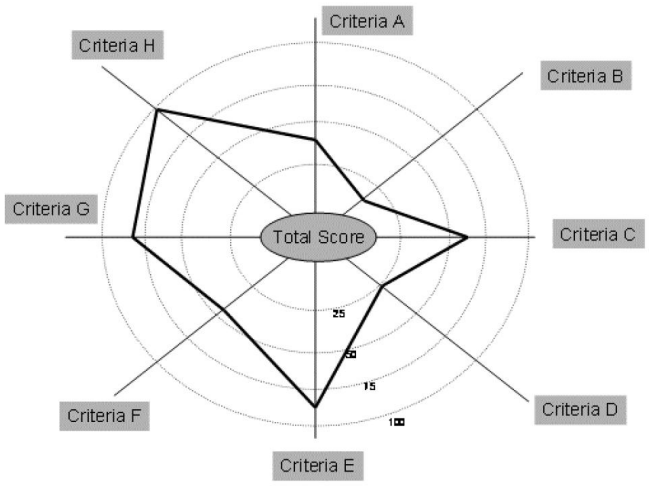
words, if the group decides to change the weights or scores for some of the criteria or technology options, then the ranking of the technologies can change accordingly. During the group discussion therefore, it is essential to try various iterations to check the sensitivity of the matrix to such changes. This can actually provide important insights as to how different criteria contribute in the final decision and thus help the group in making a rational and robust decision.

For conducting such sensitivity analysis, it is possible to develop a simple spreadsheet model, and try out various weights and scores to see how they influence the final scores and thus, the decisions.

D-3.8 Star diagram for presentation of outcomes

Another limitation of weighted sum matrix is that at the end of the process, users get an aggregated score for each technology option and it is not possible to see as to which were the dominating criteria amongst all. To overcome such a situation, it is recommended that the total scores for each technology options may be represented using a star diagram as shown in Figure 4.

Figure 4: Star diagram for the presentation of outcomes



Such a diagram can illustrate the influence of various factors in the final scores. In some cases, for instance, the total score earned by a technology system may be the highest, but this could be due to the contribution of non-priority criteria This will require revisiting the weights and scores to ensure that the total scores are in accordance with the priorities defined by the stakeholder groups, and thus lead to a more rational and acceptable decision.

D-4. Anticipatory Scenario building

When a stakeholder group undertakes a systematic SAT, it starts with a set of

technology systems based on the current situation analysis. However, it may so happen that the selected best technology system choice made with the current set of information may be found to be inadequate or inappropriate in the future. This may happen due to changes in the situation, local requirements, legislations or even the new developments on technology front.

It is therefore recommended that once the group has completed one cycle of the SAT, before making a final decision, the same methodology be used to simulate certain future scenarios and ensure that the outcome of the current exercise is robust enough and can the suggested technology system can stand the test of time.

D-5. Implementation / monitoring

Once the decision is made, it would then form the basis for further steps such as detailed engineering design, tendering, actual construction and commissioning. It is also important to monitor and evaluate the technology system during its operational phase to ensure that it is meeting the desired objective vis-à-vis various criteria considered during the SAT process.

D-6. Feedback loop

The outcomes of the monitoring and evaluation should be reported to the stakeholder group especially government agencies, planners and other decision makers. Such important information from implementation forms the basis for situational analysis for similar future projects, and hence can help in making better-informed decisions.

Table 2: Proposed Generic Criteria and Indicator System

Group Heading	Criteria	Indicators
Tier 1: Screening Criteria		
Compliance	Compliance with Local Environmental Laws	Yes / No
	Compliance with National Environmental Laws	Yes / No
	Compliance with ultilateral Environmental Agreements (MEAs)	Yes / No / Not Applicable
Other Requirements	Meeting the objectives (e.g. 3R, Remediation, Rehabilitation etc.)	Yes / No
Tier 2: Scoping Criteria		
Technical Suitability	Compatibility with local Natural Conditions (Geographical, Climate)	Low / Medium / High / Not Applicable
	Extent of local materials usage	Low / Medium / High / Not Applicable
	Availability of local expertise	Low / Medium / High/ Not Applicable
	Track record on performance	Low / Medium / High / Not available
	Compatibility with existing situation (technology, management systems)	Low / Medium / High / Not Applicable
	Adaptability to future situations	Low / Medium / High / Not Applicable
	Process Stability	Low / Medium / High
	Level of Automation / Sophistication	Low / Medium / High
Environment, Health and Safety Risks	Risk levels for workers	Low / Medium / High
	Risk levels for communities / beneficiaries	Low / Medium / High
	Risk to the environment e.g. to biodiversity	Low / Medium / High
Environment: Resources and Emissions	Resource Usage	

	Space Requirement	Low / Medium / High / Not Applicable
	Energy Consumption per unit	Low / Medium / High / Not Applicable
	Extent of use of renewable energy	Low / Medium / High / Not Applicable
	Extent of use of waste materials as input	Low / Medium / High / Not Applicable
	Water Consumption	Low / Medium / High / Not Applicable
	Raw Material Consumption	Low / Medium / High / Not Applicable
	Resource Augmentation Capabilities	Low / Medium / High / Not Applicable
	Emissions	Low /Medium / High/ Not Applicable
	Odour	Low / Medium / High
	Extent of use of Hazardous Materials	Low / Medium / High
Economic / Financial Aspects	Capital Investment	Low / Medium / High
	Operation and Maintenance Costs	Low / Medium / High
	Benefits (Energy, fertilizer, reclaimed land, enhanced biodiversity)	Low / Medium / High / Not Applicable
Social / Cultural Aspects	Acceptability	Low / Medium / High
	Extent of necessary resettlement and rehabilitation of people	Low / Medium / High / Not Applicable
	Income Generation Potential	Low / Medium / High
Tier 3: Detailed Assessment Criteria		
Environment: Resources and Emissions	Land/Space Requirement	Area of land occupied by installation of the technology (including surrounding buffer margins) vis-à-vis availability
	Energy Consumption	
	Fuel	Type of Fuel Quantity per unit

		operating hours or unit output
	Electricity	Quantity per unit operating hours or unit output
	Steam	Quantity per unit operating hours or unit output
	Raw Materials Consumption	Quantity per unit output or production
	Water Consumption	Quantity per unit output or production
	Emissions	Quantity per unit output or production
	Noise & Vibrations: Noise levels near installation during operation	Intensity in Decibels
Economic / Financial Aspects		
	Capital Costs	
	Operation & Maintenance Costs	
	Benefits (Energy, fertilizer, reclaimed land, enhanced biodiversity, Carbon credits)	Economic returns
	Economic Viability	NPV, IRR, C/B Ratio, Payback Period

End of Document

【Power Point】

Regional Environmental Cooperation and Environmental Technology in Asia

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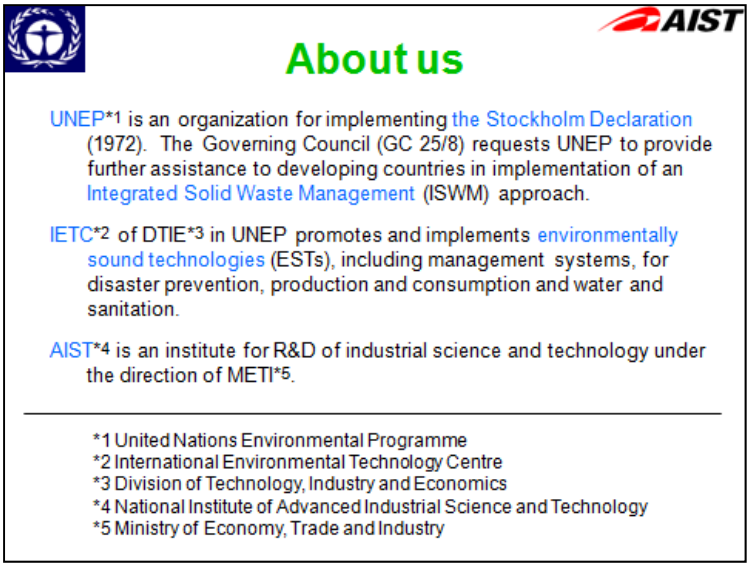
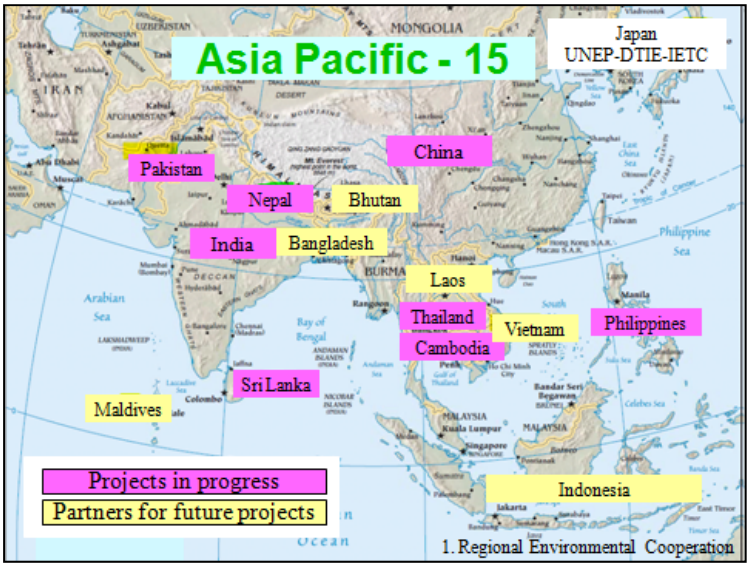


Presentation Outline

1. Regional Environmental Cooperation – Purpose and Current Projects of Solid Wastes Management
2. Cooperation Mechanism for Promoting Environmental Countermeasures
3. Transfer of Suitable Technologies to Developing countries

Cooperation in Integrated Solid Wastes Management

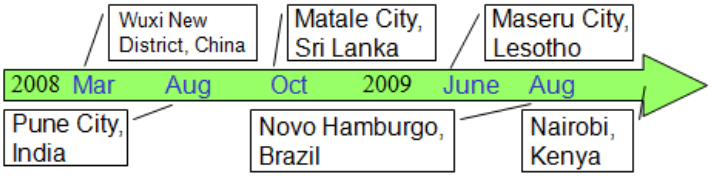
- Waste amounts increase and the various types of wastes generate with the expansion of population and economics in developing countries.
- The policy of Reduce, Reuse and Recycling of wastes is a typical strategy for reducing the environmental impacts in the local communities and waste treatment expenses of the local societies.
- Transfer of suitable systems and technologies to suitable communities are important to implement the strategic plans of 3R and the related environmental policies based on the decisions by participating countries.



UNEP Activities on ISWM

Training Package on ISWM - online

ISWM Plans for the cities below



Regional Training for
- South-South Cooperation on ISWM – Bali 2008
- Africa in Mauritius – Mar 09
- Asia-Pacific in Osaka – Oct 09

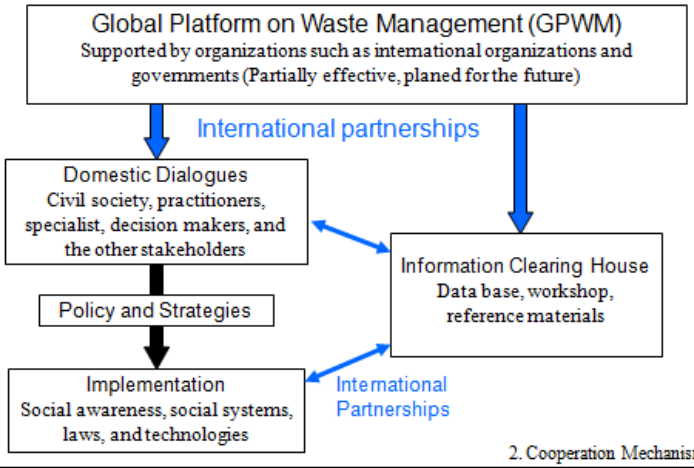
1. Regional Environmental Cooperation

UNEP Activities on the Specific Wastes

- **E-waste management:**
  Manual on Inventory - online
  Manual on Management - online
  Plan for Pnom Penh City, Cambodia – In progress
- **Converting agricultural waste biomass into a resource:**
  Compendium of Technologies - online
  Piloting in Nepal, Pakistan, Philippines and Sri Lanka
- **Converting waste plastic into a resource:**
  Compendium of technologies - Dec 09
  Piloting in India, the Philippines and Thailand
- **Waste management in the context of climate change**
- **Sustainability Assessment of Technologies (SAT)**

1. Regional Environmental Cooperation

Cooperation Mechanism



2. Cooperation Mechanism

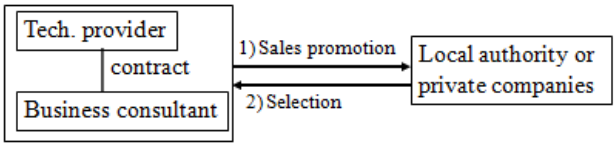
Expected Outcomes

1. Establishment of a self-propelled mechanism of developing and implementing ISWM Plans based on 3R in cities and urban areas.
2. Establishment of a network of institutions with capacity to assist national/local governments in developing and implementing ISWM Plans and management of specific waste streams based on 3R.
3. Formulation of a national policy framework to support integrated waste management as per GC 25/8.
4. Engagement of a large number of institutions and agencies
5. Increased availability and wide dissemination of best practices, manuals, guidelines, training materials and case studies.

2. Cooperation Mechanism

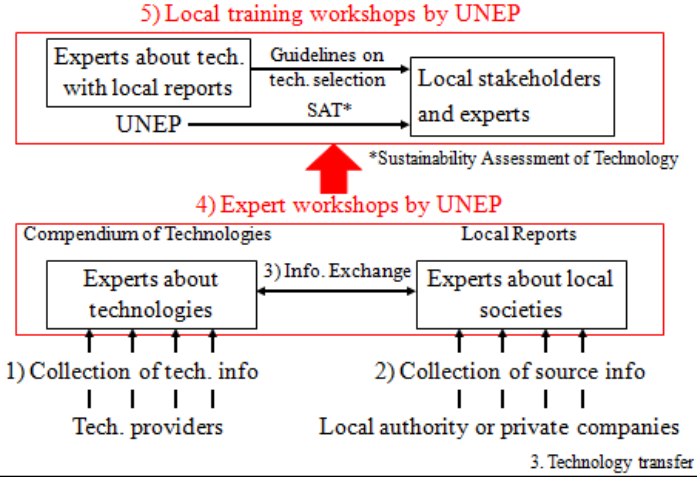
Transfer of Environmental Technologies

Conventional scheme lead by commercial dealings



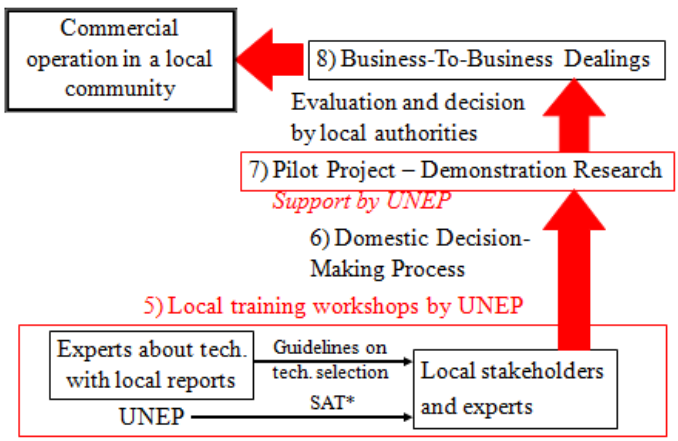
3. Technology transfer

Typical scheme on UNEP's framework-1



3. Technology transfer

Typical scheme on UNEP's framework-2



*Sustainability Assessment of Technology

Sustainable Assessment of Technology (SAT)

- SAT Methodology …

… Integrates Environmental, Social and Economic Considerations

… Focuses on environment and development together and puts them at the centre of the economic and political decision making process

… Can be adapted to country specific parameters and constraints

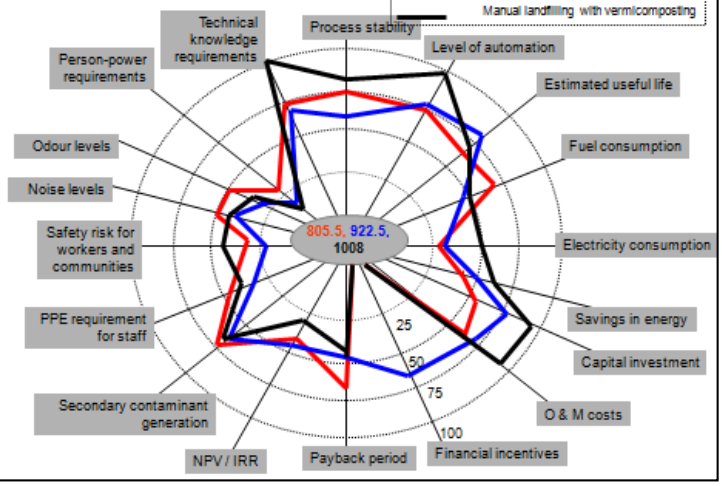
3. Technology transfer

Composite Star Diagram

Evaluation criteria

- Technical sustainability
  - *Feedstock quality and technologies matching to it*
  - *Skillful workers with knowledge to handle the technology*
  - *Training and maintenance system*
- Environmental impact
  - *Emission versus reduction of CO_2 and wastes*
- Business sustainability
  - *Stable profits by business; Feedstock supply and users' demands*
  - *Sound way of business; Accepted to local stakeholders*
  - *Contributions to the local societies; Environmental and economic benefits for the people in developing countries*

Composite Star Diagram for Detailed Assessment



Use of SAT

- Policy and Government Level
  For Strategic Planning and Policy making
- Financing Institution Level
  For Assessing projects for funding
- Operational Level
  For assessment of alternative technologies
- Community and Cluster Level
  For assessment and comparison of collective alternative technologies
- Community / Enterprise Level
  For comparing technology options

ESTs for Waste Plastics Conversion into Fuel

In progress

- Promote resource conservation by obtaining fuel from waste plastics

- Reduce green house gas by using waste plastics for the cleaner fuel production and supporting biomass utilization

Sawdust of 4300 kcal/kg

Pelletization with Plastics of 10,000 kcal/kg

RPF of 7,000 kcal/kg


Thank You…
AIST

【報告】

Environmental Cooperation and Implementation of Multilateral Environmental Agreements (Basel, Stockholm and Rotterdam Convention) in South-East Asia

「アジアにおける環境協力と多国間環境協定」

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ABSTRACT

The rapid economic and increased population growth in South-East Asia region has led to high rates of production and consumption, which cause environmental degradation such as air, water and land pollution, loss of biodiversity, destruction of agricultural and coastal areas, smoke haze from land and forest fires and other problems, which increase pressure on the natural resources of the region. These and other various common issues have become transboundary environmental issues in the region, which become a threat at the regional level.

The 10 (ten) countries in South-East Asia, namely Brunei Darussalaam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam are members of the ASEAN (Association of Southeast Asian Nations). Since 1977, environmental cooperation among its member states for sustainable development and regional integration has started with the 1st ASEAN Environmental Program (ASEP). In November 2002, ASEAN Ministers responsible for Environment agreed to focus on 10 (ten) priority areas of regional importance, among others, is addressing global environmental issues. In order to address this issue, particularly on the atmospheric and chemicals related cluster of conventions, the member countries established the ASEAN Working Group on Multilateral Environmental Agreements (AWGMEAs). Currently, The focus of the AWGMEAs on the international chemicals related cluster of conventions are the Basel Convention on the Control of Transboundary Movemet of Hazardous Wastes and Disposal, the Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade, and the Stockholm Convention on Persistent Organic Pollutants.

Member countries of ASEAN are Parties to all or some of the above MEAs. The implementation of the MEAs in the region varies in accordance with the obligations of each of the MEAs. Under Article 13 of the Basel Convention, Parties are obliged to transmit to the Conference of the Parties (COP) annually, a set of information which is specified under Article

13(3)(a) to 13(3)(i). The information is transmitted through the Secretariat under the National Reporting.

The Stockholm Convention requires Parties under Article 7 to develop and endeavour to implement a plan for implementing its obligations under the Convention, and transmit it to the Conference of the Parties within two years of the entry into force of the Convention for the Party.

Under the Rotterdam Convention, Parties are required to transmit to the Secretariat information on their Designated National Authorities (DNAs), final regulatory actions of banned or severely restricted chemicals, and import response. The Secretariat of the Rotterdam Convention has also gathered information on status of implementation of the Parties comprising ratification date, DNAs, number and details of import country responses, number of notifications of non Annex III and Annex III chemicals, and participation in technical activities.

The Decision for synergy among the Basel, Rotterdam and Stockholm Convention are adopted by the COP of the 3 Conventions, which are Decision IX/10 of the COP to the Basel Convention, Decision RC-4/11 of the COP to the Rotterdam Convention and Decision SC-4/34 of the COP to the Stockholm Convention. The 3 decisions are substantially identical which called for a greater cooperation and coordination among the Basel, Rotterdam and Stockholm conventions.

Currently, BCRC-SEA is in the process of nominating itself to also become the Stockholm Convention Regional Centre according to the selection process set forth by the Secretariat of the Stockholm Convention.

Environmental Cooperation and Implementation of Multilateral Environmental Agreements (The Basel, Rotterdam and Stockholm Convention) in Southeast Asia

(Aboejoewono Aboeprajitno and Cynthia Indriani)

I. Environmental Cooperation in Southeast Asia

The rapid economic and increased population growth in South-East Asia region has led to high rates of production and consumption, which cause environmental degradation such as air, water and land pollution, loss of biodiversity, destruction of agricultural and coastal areas, smoke haze from land and forest fires and other problems, which increase pressure on the natural resources of the region. These and other various common issues have become transboundary environmental issues in the region, which become a threat at the regional level.

The 10 countries in Southeast Asia are members to ASEAN, namely Brunei Darussalaam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam.

The environmental cooperation in ASEAN has begun since 1977 by developing a series of ASEAN Sub-regional Environmental Programmes (ASEP I, II, and III). In 1995, the ASEAN Cooperation Plan on Transboundary Pollution was adopted. It consisted of three programme areas, which were transboundary atmospheric pollution, transboundary ship-borne pollution and transboundary movement of hazardous wastes. In each programme area, the objectives, strategies, activities and institutional arrangements were further elaborated.

The ASEAN Vision 2020 was also adopted at the Second ASEAN Informal Summit held in Kuala Lumpur, Malaysia, on 15 December 1997. It set out a broad vision for ASEAN in the year 2020. In order to implement and realise the long-term vision, action plans are being drawn up, and the first on is The Hanoi Plan of Action (HPA). It covered the period of 1999 – 2004.

The ASEAN Environment Ministers then adopted the ASEAN Strategic Plan of Action on the Environment (SPAE) for 1999 – 2004, in order to move towards the future goals and directions as expressed in ASEAN Vision 2020 and the Hanoi Plan of Action (HPA). The Plan consisted of the key activities to be implemented by ASOEN and its subsidiary bodies over the next 5 years, including the areas of coastal and marine environment, nature conservation and biodiversity, multilateral environmental agreements, management of land and forest fires and haze, and other environmental activities.

The successor of the Hanoi Plan of Action is The Vientiane Action Programme (VAP), a six-year plan for period 2004 – 2010, which was endorsed at the 10th ASEAN Summit in Vientiane, Lao PDR on 29 November 2004.

The ASEAN Vision 2020 and the Vientiane Action Programme has further elaborated 12 strategies and 55 programme areas and measures to achieve the objectives of promoting environmental sustainability and sustainable natural resource management.

Currently, ASEAN environmental cooperation focuses on 10 priority areas of regional importance as reflected in the Blueprint for the ASEAN Socio-Cultural Community (ASCC Blueprint) 2009-2015:

1. Addressing global environmental issues
2. Managing & preventing transboundary environmental pollution
3. Promoting sustainable development through environmental education and public participation
4. Promoting environmentally sound technology (EST)
5. Promoting quality living standards in ASEAN cities/urban areas
6. Harmonising environmental policies and databases
7. Promoting the sustaiable use of coastal marine environment
8. Promoting sustainable management of natural resources and biodiversity
9. Promoting the sustainability of freshwater resources
10. Responding to climate change and addressing its impacts

Addressing the global environmental issues is one of the key programme areas, which, principally aims at addressing the issues related to atmospheric and chemical related conventions, such as climate change and hazardous and toxic wastes / chemicals. ASEAN's cooperation focuses on sharing of experiences and information, developing common understanding / positions and capacity building to meet the obligations of the relevant conventions.

This particular key programme area is under the purview the ASEAN Working Group on Multilateral Environmental Agreements (AWGMEAs), which is established by the ASEAN member countries as the subsidiary body of ASEAN Senior Officials on the Environment (ASOEN). The AWGMEAs aims to :

- Strengthen cooperation among member countries in the implementation of

existing international instruments or agreements in the field of environment, taking into account, in particular, the needs of ASEAN

- Identify and address and problems that constraint the member countries, from participating in or duly implementing international environmental agreements or instruments and, where appropriate, to review or revise them for the purpose of further integrating environmental concerns into the development process

- Promote and support the effective participation of ASEAN countries in the negotiation, implementation, review and governance of international environmental agreements or instruments, including appropriate provision of technical and financial assistance and other available mechanisms for this purpose

- Exchange views and information on new or revised Multilateral Environmental Agreements

- Upgrade ASEAN capacity for negotiations in Multilateral Environmental Agreements

Currently, the focuses of the AWGMEAs are the following international chemicals related cluster of conventions :

- The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Disposal

- The Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade

- The Stockholm Convention on Persistent Organic Pollutants (www.aseansec.org)

The 13 Meeting of AWGMEAs was held in Nay Pyi Taw, Myanmar on 23 – 25 July 2009.

II. Implementation of Multilateral Environmental Agreements (The Basel, Rotterdam and Stockholm Convention) in Southeast Asia

2.1 The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Disposal

The Basel Convention is the most comprehensive global environmental

agreement on hazardous and other wastes. It was adopted on 22 March 1989 and entered into force on 5 May 1992. As of November 2009, it has 172 Parties. Eight members of ASEAN are Parties to the Basel Convention, namely Brunei Darussalam, Cambodia, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam.

The main goal of the Convention is to protect, by strict control, human health and the environment against the adverse effects which may result from the generation and management of hazardous wastes and other wastes. The mechanisms used for achieving the goal is by the control of the transboundary movement of hazardous wastes and other wastes and environmentally sound management (ESM) of those wastes. The full text of the Basel Convention can be downloaded from http://www.basel.int/text/documents.html.

Under Article 13 paragraph 3 of the Convention, Parties are obliged to transmit a report on the previous calendar year through the Secretariat of the Basel Convention, before the end of each calendar year containing the following information:

(a) Competent authorities and focal points that have been designated by them pursuant to Article 5;

(b) Information regarding transboundary movements of hazardous wastes or other wastes in which they have been involved, including:

  (i) The amount of hazardous wastes and other wastes exported, their category, characteristics, destination, any transit country and disposal method as stated on the response to notification;

  (ii) The amount of hazardous wastes and other wastes imported, their category, characteristics, origin, and disposal methods;

  (iii) Disposals which did not proceed as intended;

  (iv) Efforts to achieve a reduction of the amount of hazardous wastes or other wastes subject to transboundary movement;

(c) Information on the measures adopted by them in implementation of this Convention;

(d) Information on available qualified statistics which have been compiled by them on the effects on human health and the environment of the generation, transportation and disposal of hazardous wastes or other wastes;

(e) Information concerning bilateral, multilateral and regional agreements and arrangements entered into pursuant to Article 11 of this Convention;

(f) Information on accidents occurring during the transboundary movement and disposal of hazardous wastes and other wastes and on the measures undertaken to deal with them;

(g) Information on disposal options operated within the area of their national

jurisdiction;

(h) Information on measures undertaken for development of technologies for the reduction and/or elimination of production of hazardous wastes and other wastes; and

(i) Such other matters as the Conference of the Parties shall deem relevant

The online reporting database of the Basel Convention contains data and information on hazardous wastes and other wastes, as transmitted by Parties, annually, pursuant to Article 13 (3) of the Convention, and can be seen at http://www.basel.int/natreporting/questables/frsetmain.html.

Also Pursuant to Article 13 (3), the compilations of the information contained in the national reports as transmitted by Parties, can be seen at http://www.basel.int/natreporting/index.html.

The Country Fact Sheets contains the latest information available as at September/October 2009 and published by the Secretariat in October 2009 as in http://www.basel.int/natreporting/cfs.html.

In North-East and South-east Asian countries, there is an increasing concern about international trade of hazardous wastes. The transboundary movements of hazardous wastes under the Basel Convention are internationally traded for material recovery, such as precious metals. However, illegal transboundary movements of hazardous wastes occur, which are treated in the environmentally unsound manner and cause the adverse effects to human health and the environment. In view of gaining appropriate control on such illegal shipments, the Government of Japan proposed the establishment of the *"Asian Network for Prevention of Illegal Transboundary Movement of Wastes"* and a project including preparatory work for establishing the Asian Network has been reported to and acknowledged by Parties at the 1st Session of the Open-ended Working Group of the Basel Convention (OEWG1) in Geneva, 28 April – 2 May 2003.

The Network aims at facilitating the exchange and dissemination of information on transboundary movements of hazardous wastes and selected used products among North-east and South-east Asian countries, and assisting participating countries in formulating appropriate legislative response to such movements under each country's system taking into consideration necessary procedures required by the Basel Convention. This system also provides useful information that can contribute to capacity building for the implementation of the Basel Convention (http://www.env.go.jp/en/recycle/asian_net/).

Under the framework of the Asian Network, activities have been carried out since 2003 with the 1st work year activities until 6th work year activities. BCRC-SEA

has co-organized one of the activities which was the Workshop 2009 of the Asian Network for Prevention of Illegal Transboundary Movement of Hazardous Wastes held on 20 -22 January 2009 in Kuala Lumpur, Malaysia. The Workshop was hosted by the Department of Environment (DOE) Malaysia and funded by the Ministry of the Environment, Government of Japan. (http://www.env.go.jp/en/recycle/asian_net/activitiesreport.¥html

During the workshop, member countries shared updates on enforcement activities of the Basel Convention, including the Southeast Asian Countries which are Parties to the Basel Convention. Information shared includes :

Brunei Darussalaam

- Definition for hazardous wastes
- Regulations for hazardous wastes management
- Generations of hazardous wastes
- Disposal Practises
- Recommendation
- Current Activities (hazardous substance and waste control, control of toxic chemicals, import and export statistics, illegal import and export cases, activities in 2007)
- Future Activities
- Challenges and Difficulties

Indonesia

- Indonesia in brief
- Regulations of Waste Management
- Regulations on Import – Export of Hazardous Waste
- Export of Hazardous Waste Year 2008
- Indonesia's Experience on Illegal Imports of Waste Year 2004 - 2008
- Constrains
- Activities
- Need Assessment In enforcement on illegal import of hazardous waste

Malaysia

- Legal and Institutional Measures
- Quantity and Type Of Scheduled Wastes Exported and Imported (tonnes), 2003-2007
- Illegal Import of Scheduled Wastes
- Guidelines For The Classification of Used Electrical and Electronic Equipment in Malaysia

- Activities Conducted in 2008/2009

Philippines

- Legislation, Implementing Rules and Regulation
- Classification of Hazardous Waste
- Summary of Notifications (Received / Consented)

Singapore

- Introduction
- Control of Hazardous Waste
- New Initiative on Control of E-Waste
- Enforcement Activity
- Conclusion

Thailand

- Control of E-Waste
- Control of used Electronics Equipment
- Cooperation with custom

A report was also prepared by Department of Industrial Works, competent authority of the Basel Convention in Thailand, on the measures and implementation to the Basel Convention in Thailand and can be downloaded from the website of Department of Industrial Works, Thailand, as well as the website of the Asian Network Secretariat at the following link :
http://www.env.go.jp/en/recycle/asian_net/reports/fifthyearwork/Handout/12_Thailand-handout.pdf

Vietnam

- Changing of Competent Authority/Focal Point
- Updates on newly rules and regulations/legislation under discussion
- Hazardous Waste (HW) Import and Export Statistics
- Illegal import and export cases
- Other activities
- Challenges and Difficulties

The complete country presentations on the above information can be downloaded from the link below : http://www.env.go.jp/en/recycle/asian_net/activitiesreport.html

2.2. The Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade

The Rotterdam Convention is a global international agreement aimed at protecting human health and the environment from the potentially harmful effects of

certain hazardous chemicals, including some pesticides and industrial chemicals.

The text of the Convention was adopted on 10 September 1998 by a Conference of Plenipotentiaries in Rotterdam, the Netherlands and entered into force on 24 February 2004. The full text of the Rotterdam Convention can be downloaded from : http://www.pic.int/ home.php?type=t&id=49&sid=16.

The Convention creates legally binding obligations for the implementation of the Prior Informed Consent (PIC) procedure. It was built on the voluntary PIC procedure, which was initiated by UNEP and FAO in 1989 and ceased on 24 February 2006.

The objective of the Convention is to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals, in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use by facilitating information exchange about their characteristics, providing for a national decision-making process on their import and export and disseminating these decisions to Parties.

The scope of the Convention are pesticide and industrial chemicals banned or severely restricted for health or environmental reason by Parties and severely hazardous pesticide formulations (SHPF) which present hazard under conditions of use in developing countries or countries with economies in transition.

As of November 2009, it has 130 Parties. Five members of ASEAN are Parties to the Rotterdam Convention, namely Malaysia, Philippines, Singapore, Thailand, Vietnam.

Under the Rotterdam Convention, Parties are required to transmit to the Secretariat information on their Designated National Authorities (DNAs), final regulatory actions of banned or severely restricted chemicals, and import response. The Secretariat of the Rotterdam Convention has also gathered information on status of implementation of the Parties comprising ratification date,Designated National Authorities (DNAs) and Official Contact Points (OCPs), number and details of import country responses, number of notifications of non Annex III and Annex III chemicals, and participation in technical activities.

The status of implementation of Parties is as in the country profiles transmitted to the Secretariat of the Rotterdam Convention and can be found on http://www.pic.int/reports /countryprofiles.asp. The information contained is related to :

- Ratification date
- DNAs and OCPs details
- Number and details of Import Country responses

- Number of Notifications on NON Annex III chemicals
- Number of Notifications on Annex III chemicals
- Participation on technical assistance activities

A report on a regional approach to the implementation of the Rotterdam Convention (2007-2008) was also prepared by the Asia and Pacific Plant Protection Commission and Food and Agriculture Organizations of the United Nations (FAO) Regional Office for Asia and the Pacific in 2008. It contains, among others, information on experiences on implementation of the Rotterdam Convention from 6 countries in Asia, including Malaysia and Thailand, and also development of national action plan for Rotterdam Convention implementation in Pakistan and Thailand. The complete report can be downloaded from : ftp://ftp.fao.org/docrep/fao/011/ai426e/ai426e00.pdf.

2.3 The Stockholm Convention on Persistent Organic Pollutants

The Stockholm Convention on Persistent Organic Pollutants (POPs) is a global treaty to protect human health and the environment from highly dangerous, long-lasting chemicals by restricting and ultimately eliminating their production, use, trade, release and storage. It entered into force on 17 May 2004 and as of November 2009, there are 165 Parties to the Convention**.** In ASEAN, 7 members are Parties to the Stockholm Convention. They are Cambodia, Lao PDR, Myanmar, Philippines, Singapore, Thailand and Vietnam. The full text of the Stockholm Convention can be downloaded from: http://chm.pops.int/Convention/tabid/54/language/en-US/Default.aspx#convtext.

POPs are chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of living organisms and are toxic to humans and wildlife. POPs circulate globally and can cause damage wherever they travel. The Convention seeks the elimination or restriction of production and use of all intentionally produced POPs (i.e. industrial chemicals and pesticides). It also seeks the continuing minimization and, where feasible, ultimate elimination of the releases of unintentionally produced POPs. The mechanisms to achieve the objections are through :

- Eliminating production and use of intentionally produced POPs
- Targeted for immediate elimination with very few exception e.g PCB
- Restricting production and use of certain POPs
- Very limited and carefully controlled use of certain POPs while also seeking alternatives e.g DDT to control disease vectors like mosquitos
- Reducing unintentional production with the aim of elimination

- Ensuring wastes containing POPs are managed safely and in an environmentally sound manner
- Targeting additional POPs

The Stockholm Convention initially targeted 12 of the most persistent and toxic chemicals, which are: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene (HCB), mirex, and toxaphene. Two industrial chemicals were targeted by the Convention, they are hexachlorobenzene and polychlorinated byphenils (PCBs). Unintentional chemical by-products, including dioxins and furans, are also addressed by the Convention.

At the 4th Conference of the Parties (COP) in Geneva on 4 – 8 May 2009, there are 9 new additional chemicals to Part I Annex A of the Convention, as follow :

- alpha hexachlorocyclohexane,
- beta hexachlorocyclohexane,
- chlordecone,
- hexabromobiphenyl,
- hexabromodiphenyl ether and heptabromodiphenyl ether,
- lindane,
- pentachlorobenzene
- perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride
- tetrabromodiphenyl ether and pentabromodiphenyl ether

Under Article 15, Parties are required to report to the COP on the measures it has taken to implement the provisions of the Convention and on the effectiveness of such measures in meeting the objectives of the Convention (Art 15).

At its 1st meeting the COP adopted a format for reporting and decided that the first report should be submitted by 31 December 2006, and that subsequent reports should be submitted by Parties every 4 years thereafter. Information contained in electronic reporting sistem and submitted by Parties pursuant to the Article 15 is as follow :

Part A

- Contracting party
- National focal point
- Contact officer submitting the national report
- Period reported

Part B

Information on the measures taken by the party to implement the provisions of the Stockholm Convention and on the Effectiveness of such mesures in meeting the objectives of the Convention.

Section I. Art 7 : Implementation Plans

Section II. Art 3 : Measures to reduce or eliminate releases from Intentional Production and Use

Section III. Art 4 : Register of Specific Exemptions

Section IV. Art 5 : Measures to reduce or eliminate releases from unintentional production Section V. Art 6 : Measures to reduce or eliminate releases from stockpiles and wastes

Section VI. Art 15 (2) : Production of chemicals listed in Annex A & B

Section VII. Art 9 : Information Exchange

Section VIII. Art 10 : Public Information, Awareness and Education

Section IX. Art 11 : Research, Development & Monitoring

Section X. Art 12 : Technical Assistance

Section XI. Art 13. : Financial Resources & Mechanisms

Section XII. : Other Information

Part C

Report on progress in eliminating Polychlorinated Bipenyls Pursuant to Annex A, Part II Subparagraph (G)

Section I. Art 6 : Measures to reduce or eliminate releases from stockpiles and wastes

Section II. : PCBs Inventory

Section III. : Information on production, import, export and disposal of PCBs

Section IV. : Other information

Under Article 7 of the Convention, Parties are obliged to develop and endeavour to implement a plan for implementing its obligations under the Convention, and transmit it to the Conference of the Parties within two years of the entry into force of the Convention for the Party.

The National Implementation Plan (NIP) of the Parties transmitted can be downloaded from the Secretariat of the Stockholm Convention website.

The overview of NIP of ASEAN member countries which are Parties to the Convention are as follow :

Cambodia

To achieve the national objectives related to all means of POPs management, the initiative priority activity projects that have been proposed are:

1. POPs-pesticides Reduction and Elimination Area

• Undertake assessment on the existing laws and other technical standards for amendment and promotion of effective law enforcement

• Strengthen capacity of relevant institutions in prevention of the import, trafficking and use of illegal pesticides

• Strengthen capacity on pesticides analysis focusing on POPs-pesticides

• Raise public awareness on pesticides issues including POPs-pesticides and other obsolete pesticides

• Raise awareness of policy and decision makers on pesticides issues including obsolete pesticides and POPs pesticides

• Conduct full inventory on obsolete pesticides including POPs-pesticides

• Undertake monitoring process on the trafficking of illegal pesticides including POPs-pesticides

• Prepare a collection campaign for temporarily storage of the obsolete pesticides (including POPs-pesticides) in regional storage depots prior to disposal

• Execute a Pilot Project for the disposal of a limited amount of obsolete pesticides

• Execute a nation wide project for the disposal of all obsolete pesticides (including POPs-pesticides)

2. PCBs Management Area

• Develop legal instruments and/or technical guidelines for managing PCBs release,

• Comprehensive Inventory of PCBs contaminated equipment and articles for environmentally sound
management (ESM)

• ESM Management for “in use” equipment

• Comprehensive assessment of socio-economic aspect project

• ESM compliance of the maintenance and repairing activities of electrical equipment

• Strengthen Lab capacities for PCBs analysis

• ESM Management for “out of use” equipment

• Provide and strengthen capacity and enhance public awareness on PCBs issue

• PCBs database management

3. Unintentionally Produced POPs Management Area

• Revise or develop the legislations related to sound management of unintentionally produced POPs

• Institutional strengthening and capacity building for sound management of unintentionally produced POPs
• Develop programs for public awareness raising on unintended POPs by-products
• Introduce and encourage sound waste management practices
• Promote controlling landfills and prevention of uncontrolled burning of waste
• Introduce and promote Best Available Techniques (BAT) & Best Environmental Practice (BEP) in existing waste incineration plants
• Implement guidelines on BAT & BEP in existing unintentionally produced POPs release sources
• Improve medical waste management practices
• Inventory of unintentionally produced POPs releases
• Evaluate the possibility of hazardous waste co-incineration in newly constructed cement kiln under BAT and BEP conditions

4. Management of NIP Implementation

• Improve mandate of the existing national coordinating unit for continuing the NIP coordination and implementation
• Establish and design the National Chemicals Database including POPs and persistent toxic substances (PTS) for centralization and exchanging of information
• Develop draft law on chemicals management.

The implementation of the above activities would be carried out by line ministries, particularly the Ministry of Agriculture, Forestry and Fisheries (MAFF), Ministry of Environment (MoE), and Ministry of Industry, Mines and Energy (MIME), under coordination support provided by the National Coordination Unit of the National Focal Point for the convention.

The implementation of the Stockholm Convention will be carried out within four years based on the identified priority activities/projects. The successful implementation of the above mentioned projects is based on the support provided by the government as an in kind contribution and international assistance.

Indonesia, Lao PDR, Myanmar

Transmission pending

Philippines

The baseline information on the issue on POPs in the Philippines have been identified by the preceding study "Capacity and Needs Assessment for the Implementation of the Convention on POPs". The said study has identified the following issues on POPs in the country:

• Incomplete inventories of POPs (import, transport, use, and disposal)

• Identification and management of POPs-contaminated sites
• Monitoring and surveillance of population health status relevant to potential impacts of POPs
• Screening, enforcement, and monitoring of present and future POPs control and use
• Management and disposal of POPs-contaminated equipment (PCBs)
• Insufficient legislation for dioxins and furans
• Lack of understanding and knowledge on unintentional POPs, and options for reductions

Specific strategies and action plans for a 5-year implementation period were drafted for each POPs category as follow :

Action Plans Addressing Pesticides

Goal:

Ensure that all current and future uses of POPs pesticides (legal or otherwise) are accurately identified, properly controlled, and ultimately eliminated; including the environmentally sound disposal of any unwanted and obsolete stocks and the continuous monitoring of the impacts to health and environment

Action Plans Addressing PCBs

Goal:

Achieve an effective and environmentally sound strategy to manage the total elimination and destruction of PCB-containing products, equipment, and wastes.

Action Plan Addressing Unintentional POPs

Goal:

Progressive reductions and continuous monitoring in the releases of dioxins and furans and other
unintentional POPs in the Philippines, based on scientific knowledge

Action Plans Addressing POPs Contaminated Sites

Goal:

Complete identification of all contaminated sites and hotspots with corresponding appropriate
management strategies to protect public health and the environment

Action Plans Addressing Public Awareness, Information and Education

Goal:

Full awareness and high level of knowledge across all sectors on POPs and whole support to the
implementation of the National Implementation Plan

Singapore

The Singapore's National Implementation Plan (NIP) serves to inform the Conference of the Parties (COP) and the public on the steps, methods and approaches to be taken by Singapore in meeting her obligations under the Stockholm Convention.

Having implemented all these measures, the NIP focuses on the development and implementation of POPs monitoring in Singapore, and includes activities related to research and development, awareness-raising and information dissemination.

In developing the NIP, the views and inputs of various stakeholders have been sought and included, where relevant, so as to maintain a balanced approach in the implementation of the various programmes under the Stockholm Convention

Thailand

The Thailand's NIP provides policy and strategy frameworks as well as action plans and activities to meet objectives specific to Thailand. Based on the current situation and preliminary priority assessment on POPs in Thailand, the national objectives for the NIP are :

- To establish a formalized approach to the protection of human health and the environment from the harmful impacts of persistent organic pollutants
- To comply with the implementation of Thailand's obligations under the Stockholm Convention on POPs
- To develop strategies and action plans to reduce or eliminate releases from production and stockpiles of POPs
- To prioritize and identify possible options for the management of POPs to meet country priorities, and international obligations under the Convention
- To develop a plan for improving the information base, and therefore improving the quality of POPs inventories.
- To develop a national plan for information exchange, public awareness, and education in the field of POPs management.
- To develop and implement a central database containing data and information on costs and benefits of POPs management options

Vietnam

The objective of Vietnam's NIP is to safely manage, reduce and finally eliminate POPs in Vietnam, thus fulfilling the obligations to the Stockholm Convention and toward sustainable development in Vietnam. It consists of a synchronous system of actions and solutions, including those dealing with policies, institutions, management, technology, finance, awareness raising and international integration, aiming at fulfilling the obligations of Stockholm Convention step by step. A roadmap is proposed, identifying

clear priorities to be pursued in achieving the final goal of the NIP, namely to protect the environment and human health against POPs, consistent with the Convention's objective

2.4. Synergy among the Basel, Rotterdam and Stockholm Convention

The Decision for synergy among the Basel, Rotterdam and Stockholm Convention are adopted by the COP of the 3 Conventions. The decisions are as follow :

- Decision IX/10 of the COP to the Basel Convention
- Decision RC-4/11 of the COP to the Rotterdam Convention
- Decision SC-4/34 of the COP to the Stockholm Convention

The 3 decisions are substantially identical which called for a greater cooperation and coordination among the Basel, Rotterdam and Stockholm conventions. In those synergies decisions, the conferences agreed "to convene simultaneous extraordinary meetings of the conferences of the Parties to the Basel, Rotterdam and Stockholm conventions".

The simultaneous extraordinary meetings of the COPs to the Basel, Rotterdam and Stockholm Conventions will be held in Bali, Indonesia, from 22 to 24 February 2010, in coordination with the eleventh special session of the Governing Council/Global Ministerial Environment Forum (GC/GMEF) of the United Nations Environment Programme which will be held at the same venue from 24 to 26 February 2010.

Also, By decision SC-2/15 adopted by the 2nd Meeting of COP of the Stockholm Convention, decision RC-3/8 adopted by 3rd Meeting of COP of the Rotterdam Convention and decision VIII/8 adopted by 8th Meeting of COP of the Basel Convention, the COP established the ad hoc joint working group (http://ahjwg.chem.unep.ch/) on enhancing cooperation and coordination among the Basel, Rotterdam and Stockholm conventions and mandated it to prepare joint recommendations on enhancing cooperation and coordination among the three conventions at the administrative and programmatic levels.

2.5. The role of the Basel Convention Regional Centre for South-East Asia (BCRC-SEA)

Basel Convention Regional Centre for Southeast Asia (BCRC-SEA) is a regional centre established to assist Parties to the Basel Convention in the region / Southeast Asia countries to achieve the fulfillment of the objectives of the Basel Convention. It is established according to Article 14 of the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal which requires the establishment of Regional Centers for Training and Technology Transfer (BCRC). Furthermore, according to the Decision III/19 at Conference of the Parties (COP) III in 1995, Indonesia is selected to host one of BCRCs. The Government of the

Republic of Indonesia then signed the Framework Agreement on BCRC for Southeast Asia (BCRC-SEA) with the Secretariat of the Basel Convention (SBC) on 29 October 2004 in Geneve. The Framework Agreement was later endorsed by Presidential Regulation No. 60/2005 on 12 October 2005. The BCRC-SEA is supported by 10 countries : Brunei Darussalam, Cambodia, Lao PDR, Malaysia, Myanmar, Indonesia, Singapore, Philippines, Thailand and Vietnam.

The core functions of BCRC-SEA is to provide training, technology transfer, information, consulting, and awareness raising for Parties to the Basel Convention in the region / Southeast Asia countries.

Currently, there are 14 BCRCs in the world as shown in the map below:

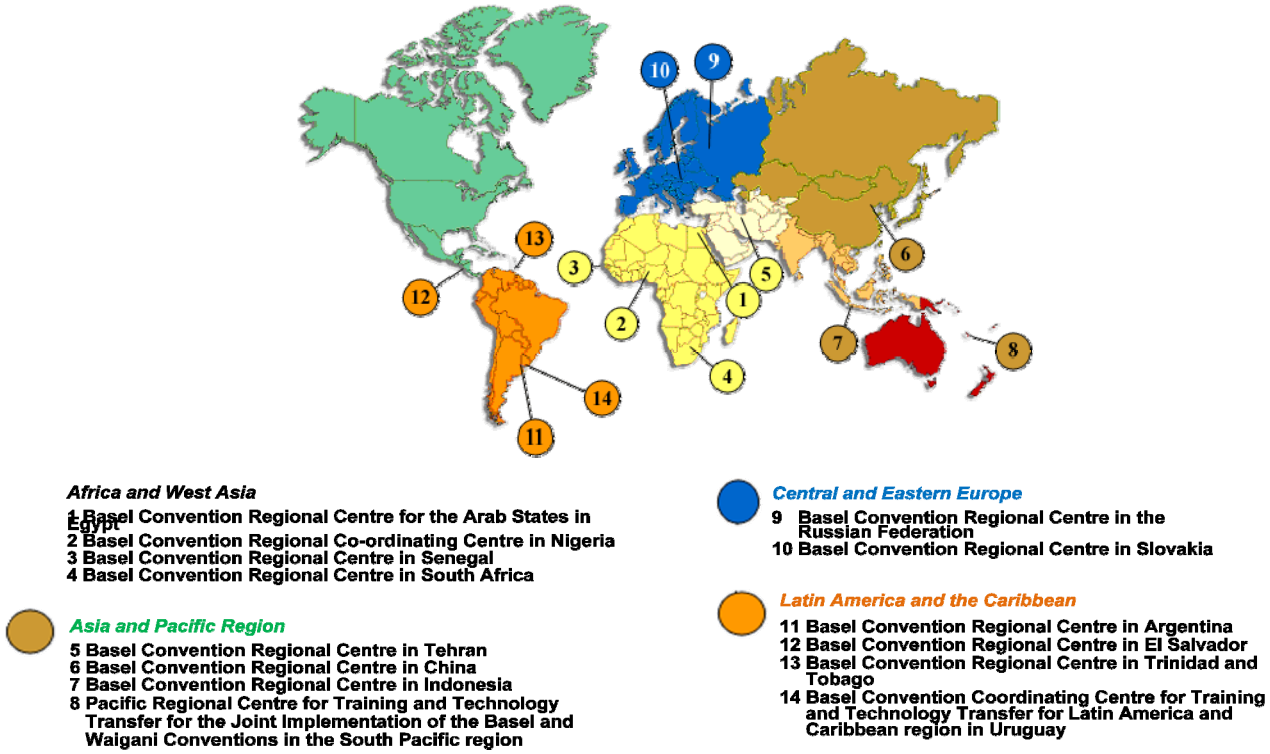

Fig. 1. Location of BCRCs in the world

Source : Secretariat of the Basel Convention, 2009

The synergy decisions among the Basel, Rotterdam and Stockholm Convention as adopted by the COP of the 3 Conventions above also called for coordinated use of regional offices and centres. According to the synergy decisions, the COPs among others :

Invites Parties and other stakeholders to promote the full and coordinated use of regional centres to strengthen the regional delivery of technical assistance under all three conventions and to promote coherent chemicals and waste management, bearing in

mind the existing and ongoing work of other multilateral environmental agreements and institutions. This work should promote the sound management of chemicals throughout their lifecycles and of hazardous wastes for sustainable development as well as for the protection of human health and the environment; and

Recommends that a limited number of regional focal centres, with the responsibility to facilitate coordinated activities in the regions covering both chemicals and waste management, be selected from among the existing regional centres of the Basel and Stockholm conventions. These focal centres will be designated following regional agreement and in accordance with the relevant procedural provisions of the respective conventions.

According to Annex to decision SC-3/12 of the COP of the Stockholm Convention on the Terms of reference for the selection of regional and subregional centres for capacity-building and the transfer of environmentally sound technologies under the Stockholm Convention, the Basel Convention regional centres, as well as other existing institutions within the chemicals and waste cluster, may be encouraged to serve as regional and subregional centres for capacity-building and the transfer of technology under the Stockholm Convention.

BCRC-SEA is now in the process of nominating itself to also become the Stockholm Convention Regional Centre according to the selection process set forth by the Secretariat of the Stockholm Convention. The selection process can be seen at the following link :
http://chm.pops.int/Programmes/RegionalCentres/SelectionofCentres/tabid/231/language/en-US/Default.aspx

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【Power Point】

Environmental Cooperation and Implementation of Multilateral Environmental Agreements (Basel, Stockholm and Rotterdam Convention) in South-East Asia

Aboejoewono Aboeprajitno

(Director at Basel Convention Regional Centre for South-East Asia, Indonesia)

ENVIRONMENTAL COOPERATION IN SEA

Background

- Rapid economic growth & increased population growth in SEA region
- High production & consumption rates, industrialisation, urbanisation
- Environmental degradation e.g *air, water and land pollution, loss of biodiversity, destruction of agricultural and coastal areas, smoke haze from , forest fires, etc*
- Increased pressure of natural resources in the region
- Various common issues have become transboundary environmental issue in the region
- Threat at the regional level

ASEAN Environmental Plans of Actions (1)

- 10 countries in SEA are members to ASEAN (Brunei Darussalaam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam)
- ASEAN Sub-regional Environmental Programmes (ASEP I, II, and III) since 1977
- ASEAN Cooperation Plan on Transboundary Pollution, adopted 1995

  (transboundary atmospheric pollution, transboundary movement of hazardous wastes & transboundary shipborne pollution)

ASEAN Environmental Plans of Actions (2)

- The Strategic Plan of Action on the Environment, (SPAE) 1999-2004
  (transboundary haze, coastal and marine, nature conservation and biodiversity, multilateral environmental agreements, other environmental activities)
- Ha Noi Plan of Action (1999-2001)
- ASEAN Vision 2020
- Vientiane Action Program (VAP) 2004 – 2010
- 12 strategies and 55 programme areas and measures to achieve the objectives of promoting environmental sustainability and sustainable natural resource management

ASEAN Environmental 10 Priority Areas

Currently, ASEAN environmental cooperation focuses on 10 priority areas of regional importance as reflected in the Blueprint for the ASEAN Socio-Cultural Community (ASCC Blueprint) 2009-2015:

1. Addressing global environmental issues
2. Managing & preventing transboundary environmental pollution
3. Promoting sustainable development through environmental education and public participation
4. Promoting environmentally sound technology (EST)
5. Promoting quality living standards in ASEAN cities/urban areas
6. Harmonising environmental policies and databases
7. Promoting the sustaiable use of coastal marine environment
8. Promoting sustainable management of natural resources and biodiversity
9. Promoting the sustainability of freshwater resources
10. Responding to climate change and addressing its impacts

Addressing Global Environmental Issue

- ASEAN Working Group on Multilateral Environmental Agreements (AWGMEA) – subsidiary body of ASEAN Senior Officials on the Environment (ASOEN)
- Principally aims at addressing the issues related to atmospheric and chemical related conventions, such as climate change, hazardous and toxic wastes/chemicals, etc
- ASEAN's cooperation focuses on sharing of experiences and information, developing common understanding/positions and capacity building to meet the obligations of the relevant conventions

ASEAN Working Group on Multilateral Environmental Agreements (AWGMEAs) (1)

Aims to :

- Strengthen cooperation among member countries in the implementation of existing international instruments or agreements in the field of environment, taking into account, in particular, the needs of ASEAN
- Identify and address and problems that constraint the member countries, from participating in or duly implementing international environmental agreements or instruments and, where appropriate, to review or revise them for the purpose of further integrating environmental concerns into the development process.
- Promote and support the effective participation of ASEAN countries in the negotiation, implementation, review and governance of international environmental agreements or instruments, including appropriate provision of technical and financial assistance and other available mechanisms for this purpose
- Exchange views and information on new or revised Multilateral Environmental Agreements
- Upgrade ASEAN capacity for negotiations in Multilateral Environmental Agreements

ASEAN Working Group on Multilateral Environmental Agreements (AWGMEAs) (2)

Currently, the focus of the AWGMEAs on the international chemicals related cluster of conventions :

- The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Disposal
- The Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade
- The Stockholm Convention on Persistent Organic Pollutants
- The 13 Meeting of AWGMEAs, Nay Pyi Taw, Myanmar, 23 – 25 July 2009

IMPLENTATION OF MEAs IN SEA

The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Disposal

Status of Ratification

8 countries in SEA are Parties to the Basel Convention:

- Brunei Darussalaam (16 Dec 2002)
- Cambodia (9 Feb 2001)
- Indonesia (20 Sep 1993)
- Malaysia (8 Oct 1993)
- Philippines (21 Oct 1993)
- Singapore (2 Jan 1996)
- Thailand (24 Nov 1997)
- Vietnam (13 Mar 1995)

National Reporting

Parties are obliged to transmit a set of information through the Secretariat of the Basel Convention annually (Art 13(3)) :

- Competent authorities and focal points
- Transboundary movements of hazardous wastes or other wastes including:
  - the amount exported, category, characteristics, destination, any transit country and disposal method as stated on the response to notification;
  - the amount imported, category, characteristics, origin, and disposal methods;
  - disposals which did not proceed as intended;
  - efforts to achieve a reduction of the amount of hazardous wastes or other wastes subject to transboundary movement;

- measures adopted in implementating the Convention;
- available qualified statistics which have been compiled on the effects on human health and the environment of the generation, transportation and disposal of hazardous wastes or other wastes;
- bilateral, multilateral and regional agreements and arrangements entered into pursuant to Article 11 of this Convention;
- accidents occurring during the transboundary movement and disposal of hazardous wastes and other wastes and measures undertaken to deal with them;
- disposal options operated within the area of their national jurisdiction;
- measures undertaken for development of technologies for the reduction and/or elimination of production of hazardous wastes and other wastes; and
- others as consider relevant by Conference of the Parties (COP)

Reporting Database (1)

The Online Reporting Database of the Basel Convention contains data and information on hazardous wastes and other wastes, as transmitted by Parties, annually, pursuant to Article 13 (3) of the Convention.

http://www.basel.int/natreporting/questables/frsetmain.html
(Parties which did not report are not listed)

- National definition of waste
- National definition of hazardous waste
- Article 1(1b) waste
- Waste requiring special consideration
- Amendment to the Basel Convention
- Export restrictions for final disposal
- Export restrictions for recovery
- Import restrictions for final disposal
- Import restrictions for recovery

Reporting Database (2)

- Transit restriction
- Usage of BC notification & movement document forms
- Language(s) accepted for Notification/Movement Document forms
- Additional information required in addition to Annex V (A and B)
- Border Control for export/import/transit of ha./other wastes established
- Reduction / elimination of generation of haz/other wastes
- Reduction of transboundary movements
- Effects on health / environment

Country fact sheets as at September / October 2009

- Brunei Darussalaam
- Cambodia
- Indonesia
- Malaysia
- Philippines
- Singapore
- Vietnam

http://www.basel.int/natreporting/cfs.html

The Asian Network for Prevention of Illegal Transboundary Movement of Hazardous Wastes (1)

- Initiated and Funded by Government of Japan
- Acknowledged by Parties at the 1st Session of the Open-ended Working Group of the Basel Convention (OEWG 1, Geneva, 28 April - 2 May 2003)
- Aims at facilitating information exchange and dissemination on transboundary movements of hazardous wastes and selected used products among North-east and South-east Asian countries, and assists participating countries in formulating appropriate legislative response to such movements under each country's system taking into consideration necessary procedures required by the Basel Convention

The Asian Network for Prevention of Illegal Transboundary Movement of Hazardous Wastes (2)

- 1st – 6th Work Year Activities (2003 – 2008)
- BCRC-SEA participated as presenter and co-organized 1 of the Network Workshop in Kuala Lumpur, Malaysia, January 2009
- SEA countries update the status of implementation of the Basel Convention in their countries
- http://www.env.go.jp/en/recycle/asian_net/activitiesreport.html

The Basel Convention Ban Amendment (1)

Background

- Parties agreed to an immediate ban on the export from OECD to non-OECD countries of hazardous wastes intended for final disposal (COP – 2) in March 1994
- Parties also agreed to ban, by 31 December 1997, the export of wastes intended for recovery and recycling (Decision II/12)
- It was proposed that the Ban be formally incorporated in the Basel Convention as an amendment (COP-3 in 1995, Decision III/1).

Scope of the Ban

- Decision III/1 does not use the distinction OECD/non-OECD countries
- Bans hazardous wastes exports for final disposal and recycling from Annex VII countries (Basel Convention Parties that are members of the EU, OECD, Liechtenstein) to non-Annex VII countries (all other Parties to the Convention)

The Basel Convention Ban Amendment (2)

Ratification

- Total number of ratifications: 65
- The Amendment has not yet entered into force
- Entry into force shall take place upon ratification by at least three-fourths of the Parties who accepted it.
- Participants from SEA :

Brunei Darussalaam, Indonesia, Malaysia

The Rotterdam Convention on the Prior Informed Consent for Certain Hazardous Chemicals and Pesticides in International Trade

Status of Ratification

5 countries in SEA are Parties to the Rotterdam Convention

- Malaysia (4 Sep 2002)
- Philippines (31 July 2006)
- Singapore (24 May 2005)
- Thailand (19 Feb 2002)
- Vietnam (7 May 2007)

Status of Implementation

Country Profiles – Parties

- Ratification date
- DNAs and OCPs details
- Number and details of Import Country responses
- Number of Notifications on NON Annex III chemicals
- Number of Notifications on Annex III chemicals
- Participation on technical assistance activities

http://www.pic.int/reports/countryprofiles.asp

The Stockholm Convention on Persistent Organic Pollutants

Status of Ratification

8 countries in SEA are Parties to the Rotterdam Convention

- Cambodia (25 Aug 2006)
- Indonesia (28 Sep 2009)
- Lao PDR (28 June 2006)
- Myanmar (19 April 2004)
- Philippines (27 Feb 2004)
- Singapore (24 May 2005)
- Thailand (31 Jan 2005)
- Vietnam (22 July 2007)

National Reporting (1)

Parties are required to report to the COP on the measures it has taken to implement the provisions of the Convention and on the effectiveness of such measures in meeting the objectives of the Convention (Art 15)

National Reporting (2)

Part A

Information on the :

- Contracting party
- National focal point
- Contact officer submitting the national report
- Period reported

National Reporting (3)

Part B

Information on the measures taken by the party to implement the provisions of the Stockholm Convention and on the Effectiveness of such mesures in meeting the objectives of the Convention

Section I. Art 7 : Implementation Plans
Section II. Art 3 : Measures to reduce or eliminate releases from Intentional Production and Use
Section III. Art 4 : Register of Specific Exemptions
Section IV. Art 5 : Measures to reduce or eliminate releases from unintentional production
Section V. Art 6 : Measures to reduce or eliminate releases from stockpiles and wastes
Section VI. Art 15 (2) : Production of chemicals listed in Annex A & B
Section VII. Art 9 : Information Exchange
Section VIII. Art 10 : Public Information, Awareness and Education
Section IX. Art 11 : Research, Development & Monitoring
Section X. Art 12 : Technical Assistance
Section XI. Art 13. : Financial Resources & Mechanisms
Section XII. : Other Information

National Reporting (4)

Part C

Report on progress in eliminating Polychlorinated Bipenyls Pursuant to Annex A, Part II Subparagraph (G)

Section I. Art 6 : Measures to reduce or eliminate releases from stockpiles and wastes
Section II. : PCBs Inventory
Section III. : Information on production, import, export and disposal of PCBs
Section IV. : Other information

http://chm.pops.int/Countries/NationalReporting/tabid/254/language/en-US/Default.aspx

National Implementation Plan (NIP) (1)

- NIP is a plan for implementing at the national level the obligations under the Convention.
- Article 7

  Parties are required to develop and endeavour to implement a plan for implementing its obligations under the Convention, and to transmit it to the COP within 2 years of the entry into force of the Convention for the Party

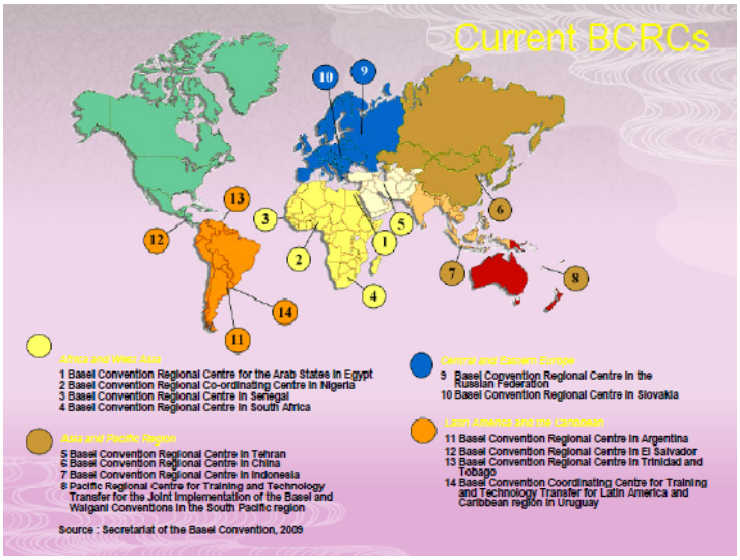
Synergi among the Basel, Rotterdam and Stockholm Convention

Cooperation & Coordination among the Basel, Rotterdam and Stockholm Conventions

Synergies Decisions

- Decision IX/10 of the 9th Meeting of the COP of the Basel Convention
- Decision RC-4/11 of the 4th Meeting of the COP of the Rotterdam Convention
- Decision SC-4/34 of the 4th Meeting of the COP of the Stockholm Convention
- Ad Hoc Joint Working Group (http://ahjwg.chem.unep.ch/)
- Simultaneous extraordinary meetings of the COP to the Basel, Rotterdam and Stockholm Conventions, Bali, Indonesia, at the Bali International Convention Centre in, Nusa Dua, from 22 to 24 February 2010

Role of Basel Convention Regional Centre for South-East Asia (BCRC-SEA)



BASEL CONVENTION REGIONAL CENTRE for SOUTH-EAST ASIA (BCRC-SEA)

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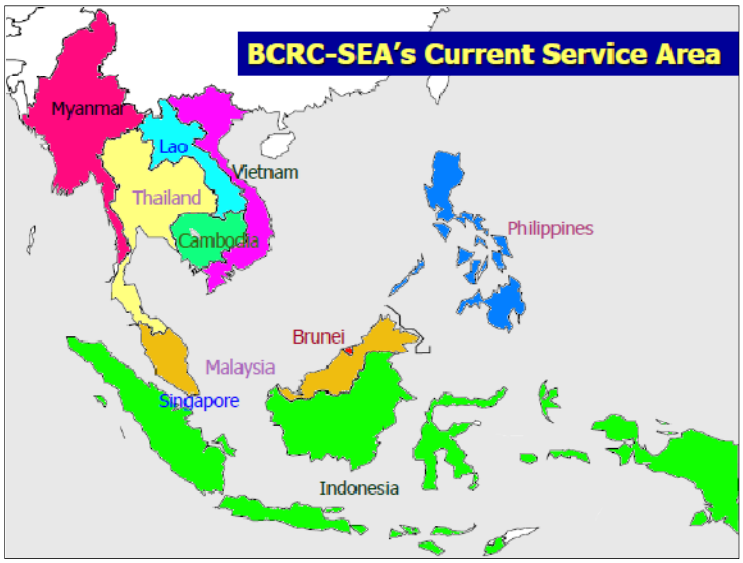
Website: www.bcrc-sea.org



BASEL CONVENTION REGIONAL CENTRE for SOUTH-EAST ASIA (BCRC-SEA)

- BCRC-SEA, one of BCRCs, serves the South-East Asian region
- Facilitates Basel Convention implementation in the **Region** by Capacity Building through
- Training,
- Technology Transfer,
- Information,
- Consulting,
- Awareness Raising

BCRCs and synergy of the Basel, Rotterdam & Stockholm Convention (1)

- Decision IX/10 of 9th COP of the Basel Convention
- Decision RC-4/11 of 4th COP of the Rotterdam Convention
- Decision SC-4/34 of the 4th COP of the Stockholm Convention
- Coordinated use of regional offices and centres

BCRCs and synergy of the Basel, Rotterdam & Stockholm Convention (1)

- *Invites* Parties and other stakeholders to promote the full and coordinated use of regional centres to strengthen the regional delivery of technical assistance under all three conventions and to promote coherent chemicals and waste management, bearing in mind the existing and ongoing work of other multilateral environmental agreements and institutions. This work should promote the sound management of chemicals throughout their lifecycles and of hazardous wastes for sustainable development as well as for the protection of human health and the environment;
- BCRC-SEA in the process of nominating as Stockholm Convention Regional Centre

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- http://excops.unep.ch
- Last accessed in Nov 2009

THANK YOU

BASEL CONVENTION REGIONAL CENTRE
for SOUTH-EAST ASIA

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【討論】

討論者：寺西俊一
(一橋大学大学院経済学研究科教授)

一橋大学の寺西でございます。10 分間ということで私の方から今の御三方のご報告に対してコメントをさせていただきたいと思います。といっても 1 対 1 のコメントはちょっと時間的に無理でございますので、全体を包括してこの第 3 セッションの「アジアの環境協力とサスティナビリティ」あるいはサステイナブルなアジアに向けた環境協力のあり方論についてのテーマに即して私の経験をふまえて 3 点ほど申し上げたいと思います。

1 点目は、私は 90 年代の初めからアジアで環境の問題が大変深刻化してきたというのが、非常に明確になって参りましたので、私自身は日本の公害や日本の環境の問題をそれまでは必死になって追っかけていたのですけれども、それを追っかけて行く先にいつの間にかアジアの庭に出てしまう。つまり、公害とか環境の問題が 90 年代以降は明らかにアジアワイドの問題に広がったということであります。日本でかつて起こった問題がアジアで繰り返され、しかも日本と共通性なり類似性があるというところもありますけれども、それぞれのアジアの各国地域の独自性も加わって、非常に複合的で深刻な日本の経験をはるかに上まわるような大きな環境を巡る問題が 90 年代以降、アジアワイドで広がった。これは国家を越え、地域を越え、アジア的共通の課題として取り組まざるを得ない問題として、クローズアップしてきたということが 90 年代から私がアジアに足を踏み入れざるを得なくなった背景にありました。

その中で私どもはアジア・太平洋 NGO 環境会議、APNEC（アプネック）と言っているんですが、これは APEC というアジア・太平洋経済協力機構をもじってですね、この E を Environment に変えて、しかも APEC は国家間協力機構ですが、我々は環境問題のガバナンスは国家を軸とした枠組みでは解けない。国家と国家は利害対立するだけで、問題を複雑化させるだけだ、というのが環境問題のリアリティでございますので、NGO 的に、つまり国家の論理を越えた論理で問題に対処していくネットワークを作らなくてはいけない。こういう観点からアジア・太平洋 NGO 環境会議、APNEC ネットワークというのを第 1 回 90 年の 12 月に万国からスタートし、つい先日第 9 回を京都で行いました。

そういう取り組みの中で最も重要なことは何かということで考えてきたときに、アジアの環境の問題とそれに対する取り組みでどうしても不可欠なのは、アジアが協力せざるを得ないということです。バラバラであってはアジアの環境は悪くなるだけ。どうやって各国、あるいは各地域、あるいは各主体の利害を越えて、アジア共通課題としてアジアの共通の基盤である環境を守るための共同的枠組みを作るか。これしか解決の方向は無い、という認識をますます強めてきたわけであります。そのための協力ネットワーク作りが、私の以来 20 年近くの取り組みの中心テーマでございました。

植田報告の中で、環境ガバナンス論の観点から非常に重要なキー概念が出ました。それは、ある種の環境は、あるいはアジアの資源は、ナチュラル・エンバイアメンタル・リソース（Natural Environmental Resource）というとらえ方をして、そのリソースの上に我々のアジアの経済活動が行われている、アジアの国家が成り立っている、アジアの我々の暮しが成り立っているとすれば、一番基礎にある究極の基盤であるアジアの自然環境資源というものをアジア共通のコモンズと考える考え方。そういう考え方を基本理念で共有しなければアジア環境協力の枠組み作りは成功しない。そういう意味で私はアジア環境共同体の理念を打ち出して、それを支える考え方のキーワードでアジアの環境はみんなにとって大事な宝、コモンズなんだ、アジア環境コモンズ論の考え方を共有しようではないかという呼びかけでいろいろな取り組みを進めてきたということでございます。

そういうことで言いますと、その各論の経緯で、廃棄物がアジアで動き回っている。日本の廃棄物は日本のリサイクル法が 90 年代に個別法で 6 つくらいできて、その上に循環型社会基本法ができて。一応法体系上は、資源リサイクルは確立した形になっているんですけれども。これは私は最初から批判していましたが、実はこれは国内で閉じた立法体系を作っているだけで、リアリティはアジアへ抜けている。つまり、資源は国際的に循環しているのでありまして、廃棄物もまた国際的に外へ抜け出しちゃっているわけですね。国内のリサイクルはそれを捕らえることができない。インフロー、フローの中でインビジブルであり、あるいはアウトローで廃棄物がアジアへ越境移動し、有害廃棄物を含めてアジア中漂流している。これがとりわけ中国に集中的に吸収されていくようなメカニズムがリアリティとして進んでいる。どうするんだということになりますと、バーゼル条約をアジアのレベルでもう一歩具体化してアジア版バーゼル条約のアジア的強化ということをどうするかということを共同で議論せざるを得ないわけです。その中で、資源リサイクルに関する技術協力や様々な資源化に対する技術の共有、こういうこともまた各論の経緯で小寺さんがおっしゃられたような取り組みが必要なわけであります。それらをさらに包括的に国全体で ASEAN なり、あるいは東アジアなり、あるいはアジア全体でアジア環境共同体的な機構を制度化して作ろうとなれば、当然その制度的ビジョン、制度設計、植田報告で言えば、インスティチューショナルな枠組みというものをどうデザインしていくか、Institutional Design for Sustainable Development あるいは Sustainability、こういうふうにおっしゃられましたけれども、アジアのサスティナビリティのための新しい制度デザイン、新しい制度設計、これに関する基本的なビジョンが必要なわけですね。それをどう考えていくのかということをやはり今から議論を始めていかなければいけない、こういうことであります。

総括的に言いますとアジアは今、国を越え、地域を越え、各主体を越えて、まさに共通して環境の問題に共同で協力して取り組まなくてはならない、これはもう事実として突きつけられている課題であって、避けられない課題です。とすれば、2 番目、これに向けてどういう協力のビジョンを打ち出すか。このときのキー概念を共有しなくてはいけない。私は、これはアジアの環境問題は、環境コモンズとしてみんなの共有物であると、この共有物をどこ

で汚そうが、どこで破壊しようが、これは全ての国々に影響が出てくる。それが環境の問題の本質である。とすれば、中国の奥地で問題が起こっているが他人のことだと言っているわけにはいかないわけですね。中国の西部で水が足りない。それはかわいそうだ、大変なことだね、西部開発は間違っているね、ということを言っているだけではダメなんですね。

日本も含めてアジア全体で食糧資源をどうするか、土壌資源をどうするか、あるいは大気資源をどう管理するか、というような各論にまで踏み込んだ協力のビジョンと制度作り、これに向けた取り組みをどう進めるか。これが非常に重要で、植田報告はその基本概念を出されたんだと私は理解しました。私は基本的に植田さんの提起されたキー概念には賛同いたします。私も同じ事を考えてきました。それで、今後、それに向けて一歩進めていこうとした場合、実はその認識はかなり私の見るところこの 20 年、各国関係者、とりわけ研究者、それから政策当局の中で先が見えている人たちの先見的な政策担当者、行政官、あるいは技術者、こういった方、ほとんどの方が同じ事を同じように語ります。ほとんどそういう意味では、そういう問題に取り組んで来られた先端の方々はほぼ同じ認識をすでに共有していると思います。そしてそれを今後どう具体化するかというときの各論が今問われている。あるいは制度化が問われている。

このときに、実は大きくネックになる問題があるんです。これは何かと言いますと、私の実感で申し上げます。国民国家の枠組みなんです。ナショナリズムなんです。これが邪魔するんです。だから ASEAN 機構とか、いろんなものを国家、政府間関係でいろいろアジア環境協力を作っています。環境省だってエコアジア会議なんべんもやっています。しかしほとんど前に行きません。なぜか。国と国が利害をつきあわせて、利害争いしているだけなんですね。国家間の利害を調整するだけで、アジアの環境問題のリアリティは解けないんです。だから私は Beyond Nation States、国家の論理をどう越えた枠組みを作るか、あるいは国家の枠組みに縛られた古いナショナリズムの狭さをアジアでどう打ち破っていくか、これはヨーロッパと比較しますと、ヨーロッパはすでに国民国家の、国民国家概念というのはかなり空洞化していると私は見ています。国民主権、国家主権を EU といったより上の概念とより下のリージョナルのガバメントの方へ、両方とも国民国家主権をいわば分権化し、そして主権の共有化を制度化しているのではないのかと思います。

そういう意味で言えば、アジアでそういうことが本当にできるんだろうか。片方でアジアではまだ治安秩序その他が国民国家の枠組みさえガタガタで、うまくできない、治安を確保するためにはまず国民国家で、強い国家を作らなくてはいけないという地域的なリアリティのあるところもあります。こういうアジアの複合的なリアリティの中で環境から突きつけられている最先端の時代の課題にどう答えるための取り組みをするか。このときに国家とはなんぞやという根本問題に議論は行かざるを得ないんではないかと思っております。とりわけ中国との問題を考えたときに、これからのビジョンは中国の国家が中心になって、中国がヘゲモニー国家としてアジアを統一していくようなアジア共同体は、僕はリアリティを持っていると思うんですが、それでは環境問題は解決しないと思うんですね。アジアは各国間が平等

な国家間関係を維持しつつ、国家の論理を越えた、リージョナルな、あるいはリージョナルコモンズの論理で地域間協力がどうできるのかという議論にきちんと踏み込んでいくことなしに、どう考えてもこれからのアジア共同環境協力の具体的な制度化はかなり大きな壁を持たざるを得ないと、私は一方でも厳しさを認識しております。ここをどう乗り越えたらいいのか、御議論いただければと思います。以上です。

討論者: Hiroshi Ohta
(Professor at School of International Liberal Studies, Waseda University)

The basic title is "Global Environmental Governance and Institutionalization of Regional Environmental Cooperation in East Asia." The debates about the necessity of establishing a world environmental organization (WEO) or global environmental organization (GEO) have subsided today compared with the early 1990s, when the Rio Summit was convened.

One of the strong reasons that support the establishment of such global environmental organizations is to counter the ever-expanding global market, backed by the principles and rules of free trade. The World Trade Organization stands tall and appears dominant, even to regulate environmental issues in favor of free trade.

However, others take a more cautious position, pointing out that the global environmental problems, such as stratospheric ozone depletion, climate change, and loss of biological diversity, as well as many other environmental problems, are too complex and diverse for one global institution to manage.

My position is similar to that of the institutionalists. I do not totally reject the idea of establishing a WEO or GEO but consider it both unrealistic and unfeasible, judging from the current situation of the United Nations Environmental Program and also conditions of unsustainable development in global environmental governance. At present, however, a more pragmatic approach of strengthening the existing international environmental regime by streamlining some overlaps among them is a valid option for consolidating environmental governance.

Therefore, in order to seek effective global environmental governance, we first need to understand complex institutional interlinkages among various international environmental regimes. Then we may be able to identify the sources of success and failure of environmental regimes.

The problems of the environment and natural resources (ENR) in East Asian are something like a double-edged sword. They can offer an opportunity for regional cooperation or can bring about conflict. Environmental problems such as acid rain and yellow sand transcend national borders, as many people have mentioned. Nations on the downwind side must depend on preventive action by nations on the windward side. In this ecologically interdependent world interstate cooperation is imperative for solving any kind of international environmental problems. But Dr. Teranishi emphasized the importance of people-to-people cooperation, going beyond the nation-states. I really agree with that.

Lagging far behind the European Union, however, the East Asian region lacks even a cornerstone for erecting a cooperative apparatus like the European Coal and Steel Community (ECSC). Thus, the institutionalization of natural-resource cooperation for tackling environmental and natural-resource problems might provide the nations in the region with unique opportunities for creating various regional environmental and natural-resource regimes. On the contrary, the absence of a cooperative scheme like the ECSC for sharing vital natural resources might lead regional powers to collide with one another over such resources.

However, despite the confrontational image of international relations in East Asia, preliminary research shows that there are quite extensive regional ENR cooperative arrangements with regard to a wide range of issues in the region, although none of them has developed into a full-fledged multilateral environmental and natural-resource regime.

In fact, we can trace some trends of institutionalization for regional cooperation in addressing ENR problems. First, regional ENR problems have now compelled concerned nations to form new functional institutions. Second, if the nature of ENR problems allows participation by environment NGOs and raises public awareness, a nascent regime has a good chance to develop into a regulatory regime. Third, severe competition over regional natural resources can cause armed conflict. But, at the same time, a clash in a tense situation can serve as a warning call about escalation of conflict into major military confrontation so that contending parties may make efforts to find ways to defuse the tensions and control escalation. Fourth, more established knowledge, clear causal relationship of concern, presents problems. So-called epistemic communities, which again many people have already mentioned, are crucial to building robust regional cooperation on ENR problems. Finally, an international convention sometimes has a positive influence on regional ENR cooperation when major regional parties ratify it.

And then, I turn to the inter-linkages of various international regimes. Both the ozone regime, whose objective is to protect the stratospheric ozone layer, and the climate-change regime consist of conventions, treaties, and protocols. We call them a regime which provides a governance system in a specific issue area. We have now many international regimes that deal with various international/global environmental problems but they lack coordination between regimes. We need to pay special attention to the interaction among various multilateral environmental agreements (MEAs), as well as certain MEAs and other international regimes (such as a free-trade regime governed by the WTO) can sometimes generate unexpected consequences or serious problems that

cannot be solved by an individual regime. For example, some interaction may generate synergistic effects, while other may cause disruptive effects.

Policies to mitigate climate change, for example, may have both positive and negative impacts on the protection of biological diversity, prevention of desertification, and protection of wetlands. If fast-growing trees, like eucalyptus, are planted by destroying mixed forests or national woodlands, as a climate-change policy, this kind of reforestation will destroy the habitat of various wild fauna and flora.

However, reforestation or even afforestation can certainly contribute to holding back expansion of desert areas and may also create a desirable local climate in which local hydrological circulation can become established. If, however, tree planting and land-use change are carried out by draining wetlands or filling a pond, such policies will have very disruptive effects on migratory birds and the regional ecosystem as a whole.

The 1989 the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal may be considered the central MEA to integrate other regimes that regulate industrial hazardous wastes. According to the Web site of the Basel Convention and also Dr. Aboejoewono, during its first decade (from 1989 to 1999) the Convention was principally devoted to setting up a framework for controlling transboundary movement of hazardous wastes. It has also developed certain criteria for environmental sound management. A control system based on prior written notifications was also put into place. During the present decade (2000-2010) the Convention is building on this framework by emphasizing full implementation and enforcement by treaty commitment.

The area of focus will be minimization of generation of hazardous wastes. The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticide in International Trade creates legally binding obligations for the implementation of prior informed consent procedures, which was built on this voluntary PIC procedure. The Stockholm Convention on Persistent Organic Pollutants is to protect human health and the environment from chemicals that remain intact in the environment for a long period of times and become widely distributed geographically and accumulate in the fatty tissue or humans and wildlife. These MEAs also imply some synergistic effects for the governance of global environmental problems.

In this context, the decision of the three MEAs (the Basel, the Stockholm, and the Rotterdam conventions) to establish the ad hoc Joint working group on enhancing cooperation and coordination among the these MEAs is quite significant. These three conventions now prepare joint recommendations on enhancing cooperation and coordination among the three conventions at the administrative and programmatic

levels.

Then, back to East Asia, there are lots of bilateral and multilateral agreements, even limited to East Asian countries like South Korea, China, and Japan. As Professor Teranishi mentioned, there are scores of regional ENR agreements. If we categorize these bilateral and multilateral agreements, they can be divided into five categories. There are transboundary air-pollution issues, marine ENR issues, concern for wildlife and migratory birds, urban environmental concerns, and multilateral and regional environmental conferences and meetings. However, all of them are still at a stage of either research, networking, information exchange, policy dialog, or meetings. There is no full-fledged regime emerged from these regional arrangements. It has not evolved. It is worthwhile noting that there is a unique subnational regional environmental cooperation initiated by the City of Kitakyushu to help alleviate air pollution of Dalian in China.

Finally, regarding regional cooperation for acid rain, under the leadership of the Japanese government, there is a kind of monitoring network called EANET, which has a potential to develop into a full-fledged regime. However, there is still a big room for political arguments, even regarding the sources and transport model of acidified substances in this region. It is necessary to overcome scientific and technical differences by political will, to call for more forceful collective action. We may be able to render scientific authority to the EANET's finding so as to promote regional cooperation. But at the same time, we need to build public awareness to spur political will to reduce acid substances in the region backed by solid scientific knowledge..

Public awareness and participation of NGOs are key ingredients of regional cooperation for problems of dust and sand storms (DSS). Unlike acid rain, the cause-and-effect relationship of the DSS problem is more visible and tangible. Another important factor is the active participation of China for this DSS problem. The causes of dust and sand storms are both natural and anthropogenic. So the nations on the downwind side cannot deal with the problem by just blaming the nations on the windward side.

When we see the issue of natural resources through the lens of economic interests or national interests, the confrontational aspects are magnified, and resource management appears anarchic. According to the conventional view, there are no agreements and no regional forums to discuss the management of shared resources in this region. Nevertheless, however limited, regarding the issue of stable and migratory fish, there is a nascent regional cooperative scheme is emerging. My preliminary studies show that multilateral arrangements or international conventions can provide a region

with an instrument for cooperation and rational management of natural resources based on bilateral agreements. A positive impact of the United Nations Convention on the Law of the Sea (UNCLOS) in the form of regional bilateral agreements on fisheries is a case in point.

Under the guidance of the UNCLOS, annual total catch has been imposed for several species, for example, sardines, mackerel, jack mackerel, chub mackerel, walleye pollack, and snow crab, all of which are popular fish for the Japanese. Some other species will be added to the list.

Moreover, local fishery officials are now required to use new computers to tabulate data on catches in major fishing ports. And these data are utilized for determining total allowable catch of dwindling fish stock in this region.

And a final word: As for South Korea and China, similar restrictions went into effect. In addition, while South Korea and Japan are going to introduce a new fishing quota system in the joint Korea-Japan EEZ, based on fish type, in November 2003 China introduced a plan to reduce the number of fishing boats by 30,000 by 2010, from 222,000 to 192,000.

Needless to say, viable verification and extensive monitoring are crucial to determine how effective this institution is for managing natural resources.

Thank you very much. I’m sorry for going overtime.

【Power Point】

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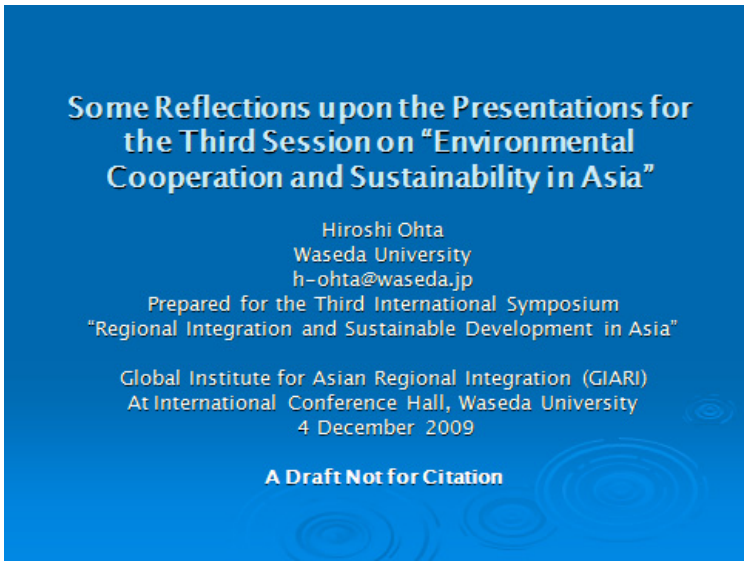
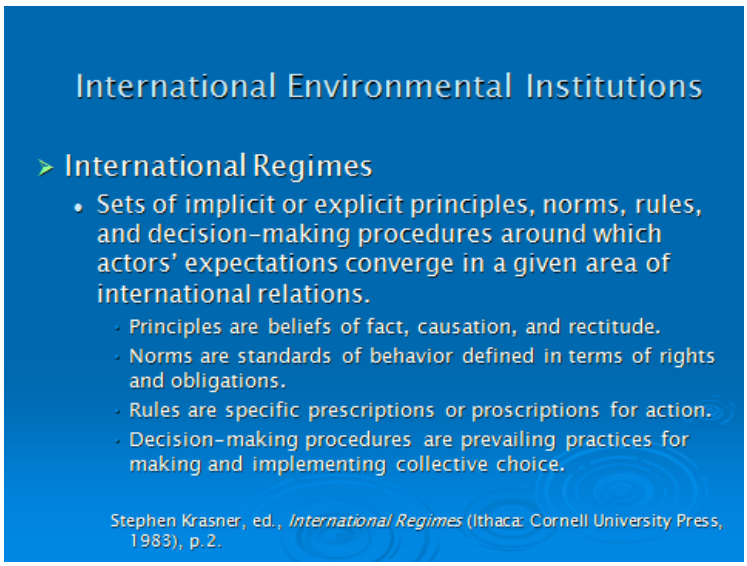
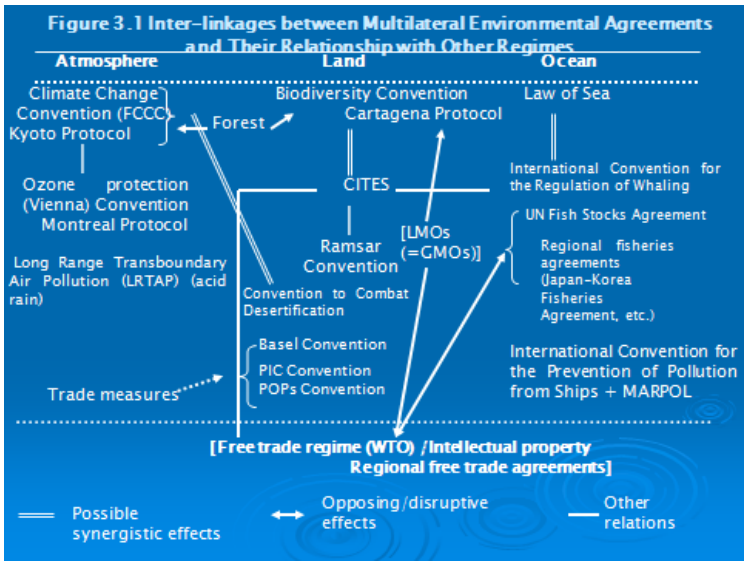






Multilateral Environmental Cooperation around East Asian Countries

- The five categories
  - transboundary air pollution,
  - marine ENR,
  - wildlife/migratory birds,
  - urban environmental concerns, and
  - multilateral regional environmental conferences and meetings.
- Almost all of their missions (or objectives) = research, networks/networking, information exchange, policy dialogue, conferences or meetings
- A unique example of regional cooperation at the sub-national level=Kitakyushu Initiative for a Clean Environment
  - ➔Help ameliorate urban and industrial pollution in Dalian, China.
  - ➔The expansion of its network by establishing the Environmental Cooperation Network of Asian Cities

討論者：田中勝也
(滋賀大学環境総合研究センター准教授)

滋賀大学の田中です。今日のお三方のご報告どうもありがとうございました。最初の報告と 2 番目の報告については日本語で、それから最後のアブさんの報告については英語でコメントをさせていただきたいと思います。

それで最初の報告が、これタイトルが違っていて申し訳ないです。私少し古い資料をもとにしてコメントを作成しておりますので、実は内容が異なるんです。植田先生の今日のご報告というのが、基本的に地域のコモンズのマネジメントと環境ガバナンス、特に様々なレベルの環境ガバナンス、これを重層的な環境ガバナンスというふうに呼んでおりますけれども、その関係性についてのご報告だったんですね。私が用意しているものがご覧の通り全く違うんですけれども、一見したところ違うんですが途上国、特に東アジアの経済発展、持続可能な発展と環境ガバナンスという、そんなに中心としてのテーマは違わないと思うんですね。

まあ少し強引な形ですが、このスライドを若干使ってご説明させていただきたいんですけれども、ここで出てくるこの山のような関係性というのは、環境汚染と環境発展がどういう関係を持っているかということなんですね。ご覧になれば分かるように、横軸が経済発展の水準で、右に行けば右に行くほど経済が発展するということです。縦軸というのが環境汚染で、これは上に行けば行くほど環境が悪くなるわけです。ご覧の通り、開発がある程度進むに連れてしばらくは環境が汚染されていくんです。上にどんどん高くなっていく。これを Brown Growth と言っていて、経済と環境が両方とも、経済が発展するに従って環境が悪化してしまう。ただあるターニングポイントを越えると、そこから先は技術革新ですとか産業の高度化に伴って経済発展と共に環境はよくなる。これを EKC、環境クズネッツ曲線と呼んでいるんですね。

これについて植田先生のもともとの論文については強い警鐘を発せられていたんです。というのはこの考え方というのは非常にシンプルなので、人々の耳目を一時非常に集めたんです。これは非常に単純な図式で非常に捕らえやすい。誰でも分かるような内容ですので、一頃非常に流行ったんです。ただし、これについてはいろいろと問題が出ていまして、これはちょっと時間的な関係もありますのではしょりますけれども、基本的に Green Growth と呼ばれる、ある程度の水準を過ぎたら経済発展をするだけで環境がよくなるという、そういう安易な考えを持ってはいかんということで。これは数多くの著名な研究者からも支持されている今では非常なポピュラーな考え方なんですね。

2 つ目の項目なんですけれども、そんなにシンプルに考えてはいけないんだけれども、じゃあ代わりに何が必要なのかっていうことを考えてみると、その重層的な環境ガバナンス。重層的というのは、これは先ほどのスライドでも紹介されたと思うんですが、グローバルなガバナンス、リージョナル、地域のガバナンス、国家のガバナンス、それから地域（ローカル）のガバナンス。これらが別個に動くのではなくて、相互に関係し合っているという、そ

ういうガバナンスが地域的な持続的な発展に必要であろうと、そういう議論なんですね。

これは単純化したスライドなんですけれども、先ほどの EKC、ある程度発展すれば環境は良くなるという議論も、ガバナンスが弱かったり、あるいはもう非常に弱い、そういうところですと環境が良くなるターニングポイントがかなり後のほうであったり、あるいは全く成立しない、そういうこともある。なので、同じ経済条件でもガバナンスというのを良くとらえて、それを発展させることが、環境あるいは経済発展にとって重要である。そういう話なんですね。

ここからが簡単なコメントというか質問なんですけれども、ただこの環境ガバナンスというのは非常に一般からすると曖昧模糊とした考え方で、特に重層的に考えるというのは非常に素人にはなかなか辛いものがあります。このような東アジアの経済発展、それから持続可能な成長というコンテクストで考えてみた場合に、どういったガバナンスの中の要素が特に重要なのかというふうな、個人的な御見解で結構ですので、お教えいただければなと思います。

それからこういった地域の持続可能な発展を考えるときに、アフリカですとかヨーロッパ、アジアというのは政治も文化も違えば、経済発展の度合いも違いますから、やはりガバナンスで求められる要素も違ってくると思うんです。アジアの場合、特にアジアに注目した場合特に重要なものというのはどういうものなのか。

それから、環境ガバナンスの中には、少し強引な議論になるかもしれませんが、環境条約というのは 1 つのガバナンスのあり方だと思うんですね。環境ガバナンス、例えば今日はせっかくセンターのディレクターがおられますので、バーゼル条約のようなアジアの中での廃棄物の移動ですとか、そういったものを抑える、そういった環境条約というのはガバナンスの中でどういう役割を果たせるのか、その点について教えていただければなと思います。

それから 2 つ目の報告なんですけれども、こちらの報告というのはこれは非常に理系的な報告なんですけれども、文系的な、非常に学際的な内容で、私はプラスティックを燃料にですとか、理系的なところは少々疎くて申し訳ないんですけれども。ただこのご報告はテクニカルなところが重要というよりは、UNEP が作っている仕組みですね、その国の状況に応じて適切な技術を提供するという仕組みが重要であって、その中で SAT（Sustainable Assessment of Technology）というのが 1 つの重要な仕組みとして機能している。最後の方でスターダイアグラムという形でそれをご呈示いただいて、それが非常に分かりやすかったんですね。

これは UNEP がアジアでそういった環境技術を普及させる、非常に有効な機能を果たしているんではないかと私は思いました。ただ、最後のところで、SAT というのはこれまた重層的でして、ガバメントレベルからコミュニティのレベルまでいろいろなところで SAT が起こっているということをご説明いただきましたが、私この分野少し明るく無いものですから、ちょっとイメージしづらかったんですね。ですので、もしできましたらその辺りの何か具体的なケースですとか、もしご存じでしたらお教えいただけると助かります。

またこれは廃棄物についてかなりいろいろとタッチされていますので、例えばバーゼル条

約なんかとどういう関わりがあるかなども教えていただけると有り難いです。

それから 3 つ目の報告なんですけれども。

Thank you very much, Professor Aboe. I asked him how to say his name, and told him his name was too long for typical Japanese like me, and he said we could just say Aboe. So I call him Aboe.

This presentation is a very nice summary of three major conventions: Basel, Rotterdam, and Stockholm. And, for example, if you search for the documentation or PowerPoint file explaining those conventions, you will be screwed up with too many informative slides or PDF. Before commenting today, I downloaded several PowerPoint files, and the worst one was about 50 pages of slides, and the font size is 10. So that's too much information.

But I think someone made those slides and tried his best. The environmental treaties include various aspects, and many things are organized in each of those treaties.

But today he presented three very major conventions, with not too much information, but he extracted the most important points: the objective of each treaty, status of ratification, and expected outcome for the future. So it is a very nice summary of those three conventions.

And more information, if you are interested in those three conventions, can be found in much more detail in his discussion paper. I think it is included in the brochure, or you can download it.

This presentation is very interesting. It is a very important topic. And also, this is somewhat related to my research interest. Professor Matsuoka, the chair of this session, and I are currently doing a kind of quantitative analysis of the effects of multilateral environmental agreements like Basel.

Everyone knows the Montreal and Basel are successful environmental treaties. But in contrast, if you look at the other environmental treaties, some treaties are not really working well or not at all.

Why is that? That's the main issue in political science and environmental economics. So we are making international panel data, including on the ratification of the environmental treaties and economic environmental indicators. And we do some regression analysis, using econometrics.

But the pitfall of those studies is this: They tend to treat different treaties independently. That means that treaty A and treaty B are very independent and do not have any relationships.

But this is one of the major pitfalls. As Aboe mentioned, he is going to have synergy meetings. That is a kind of simultaneous extraordinary meeting, so the COPs to

the Basel, Rotterdam, and Stockholm conventions.

So this kind of synergy of different environmental treaties is important. And it is getting to be popular, I think. So far it is quite a unique attempt, but this a very important move for the development of multilateral environmental treaties.

So I think to do some analysis of the effects of environmental treaties we need to consider this kind of synergy or interdependence among the various treaties.

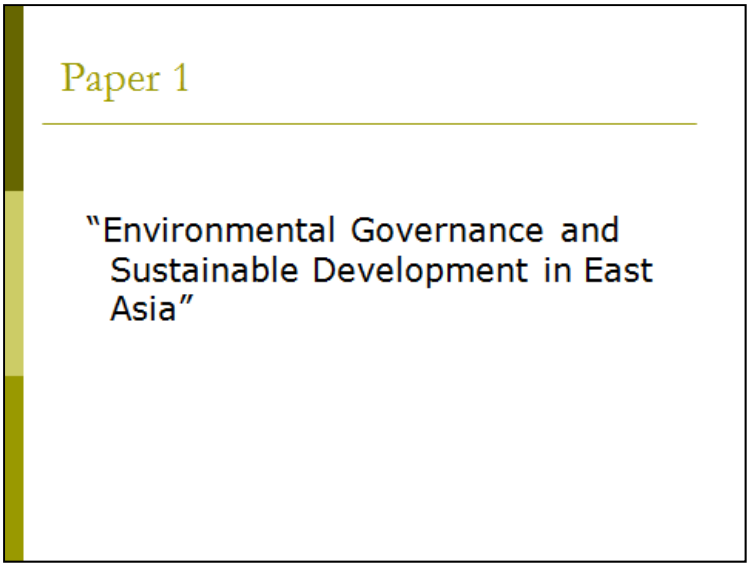
So my question is that it is going to be held in February 2010, but it is quite a unique attempt. So I think it is hard to predict. So Aboe, do you have any idea about the expected outcome or any other idea about this synergy meeting?

So that's it for my comments and question. Thank you.

【Power Point】

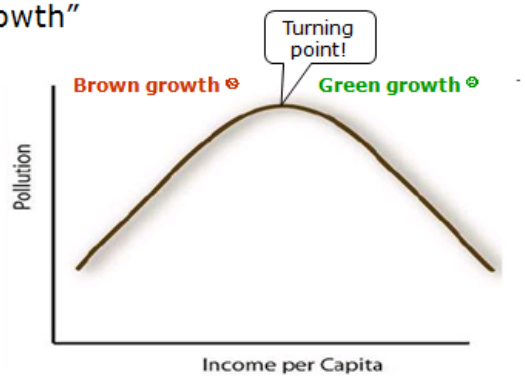
討論者：**田中勝也**

（滋賀大学環境総合研究センター准教授）



Major Contributions

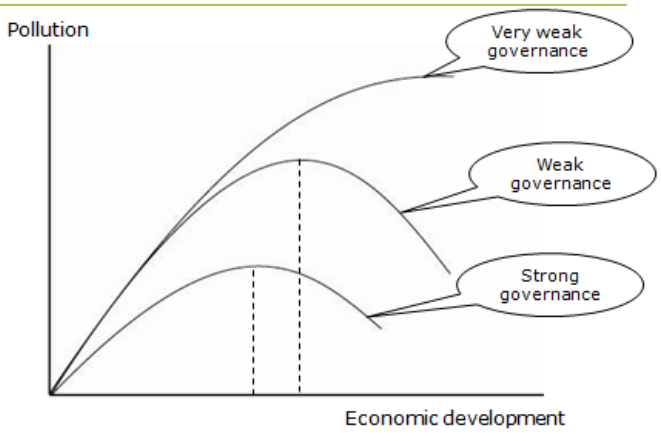
- Critical review on the EKC and "green growth"



Major Contributions

- Critical review on "green growth" (cnt'd)
  - One of the most academically important critiques on the EKC
  - Green growth cannot automatically realize sustainable development
- Importance of multi-level environmental governance for sustainable development in Asia
  - Global, regional, national, local

Example: EKC and Different Governence Levels



Comments and Questions

- The role of environmental governance has gained rapidly increasing attentions
  - What are major driving force among many elements in environmental governance?
  - Any region-specific factors in Asia?
  - The role of multilateral environmental treaties (such as Basel Convention)

Paper 2

"Regional Environmental Cooperation and Environmental Technology in Asia"

Major Contributions

- Very good overview of environmentally sound technologies (ESTs) and its transfer
  - Important base for UNEP-related activities on the specific wastes
  - Sustainable Assessment of Technology (SAT) as key component
    - Composite star diagram as evaluation criteria

Comments and questions

- Environmentally sound technology transfer is one of key factors for:
  - Enhancing regional environmental integration
  - Promoting greater ratification of multilateral environmental treaties (MEAs)
    - Any specific effects on existing treaties (such as Basel)?

Comments and questions

- Multi-level use of SAT
  - Policy and government level
  - financing institution level
  - operational level
  - community and cluster level
  - community/enterprise level

→ Any example for better understanding of SAT?

Paper 3

"Environmental Cooperation and Implementation of Multilateral Environmental Agreements on Chemicals and Wastes in SEA"

Major Contributions

- Thoughtful descriptions of Basel, Rotterdam, Stockholm Conventions
  - Excellent summary (not too much!)
  - More information available in his discussion paper

Comments and Questions

- Effects of MEAs
  - Number of descriptive and econometric studies
  - Basel recognized as one of successful treaties
- Pitfall of most existing studies
  - Treat different MEAs independently
  - i.e., treaty A and treaty B have no relations

→ Not always true, but generally weak connections among MEAs (i.e. little synergy among MEAs)

Comments and Questions

- Synergy of multiple conventions
  - The simultaneous extraordinary meetings of the COPs to the Basel, Rotterdam, and Stockholm Conventions
    - Bali, February 24-26, 2010
  - Quite unique attempt, potentially an important milestone of MEAs development
  - What are expected outcomes?

【質疑応答】

松岡：　ありがとうございました。それではちょっと時間が押しまして後 15 分ほどになりましたけれども、フロアの方から意見、コメント、質問もおありでしょうから、2 つ、3 つフロアの方から、質問、意見、コメントがありましたら受けまして、それからパネル、コメンテーターの方に最後一巡をしたいと思います。いかがでしょうか。

それではご所属とお名前を言っていただいてからお願いします。

フロア：　オーストラリア国立大学から参りました小林ハッサルやすこと申します。

My question goes to Professor Aboejoewono's presentation. I was just wondering if you could have any sort of examples, like in how you struggle to create something like a regional consensus regarding environmental issues, because as far as I know there are lots of conflicts of interest among Southeast Asian countries, simply because this region has got quite a lot of diversity among societies, not just economic but political, linguistic, and cultural.

So it seems that, really, all these environmental agreements and declarations, even on a practical level, seem to be quite smooth. But environmental issues easily turn nationalistic. This causes conflicts between Singapore and Indonesia and Singapore and Malaysia.

So could you elaborate a little bit on actual struggles that you are dealing with on a daily basis?

Thank you.

松岡：　ありがとうございました。続いてどなたかございますでしょうか。いかがでしょうか。せっかくの機会ですので是非何かコメント質問ございましたらと思いますけれども。よろしいでしょうか。それじゃ。

フロア（天児）：　それぞれの皆さん方の非常に重要な示唆に富んだご発言をありがとうございました。1 つ、私は寺西先生のご意見について、少しお尋ねしたいんですけれども。つまり基本的な考え方として私は非常に理解できますし、私自身もそういった部分をたくさん持っていると思うんですが、現実に私は中国を専門にしながらアジアの、特に政治分野でいろいろとやって

おりまして、その場合にぶつかる問題がですね、政治で言えば安全保障の問題と言いますが、国家の安全保障と人間の安全保障とどういう風に兼ね合わせるかということにぶつかるわけですね。そして当然国家の安全保障というと、国家利益の問題というのがおっしゃるようにもう正面からぶつかっていくということがあります。

そうは言いながらも、結局今起こっているアジアの環境、あるいは感染症とか、自然災害とか、様々な問題を解決するときに、1 つは人材の問題ですね。政府の存在というもの、ガバメントの存在を無視できない。それから資金の問題でも無視できない。それからネットワークの面でもやはり無視できない。こういったことを考えた時に、私はおっしゃられるような意味で環境の問題も国家に任せると利害対立で終わっちゃう、人間というかヒューマンのネットワークが必要なんだという。これは理論的にはおっしゃる通りなんだけど、現実の問題として、そこにじゃあ国家というものをエクスクルードしてそういう議論ができるかといったらやっぱりできない、というのが現実だと思うんですね。

私はむしろそこの中で、何をすべきかというふうに問題を設定すべきであって、国家か、人間、ヒューマンレベルの問題かという設定ではない。一番重要なのは、1 つはやはり国家の役割というのをもう一度見直して見るという必要があると思うんですね。つまり、国益だけが国家の役割なのかという、そこのところをどう捉えるのかということ。

それともう 1 つは、やはり国境を越える、国益を越える議論というのは議論だけではなくて、そういう意識を持つ人を育てていかなくてはいけない、そういうネットワークを作っていかなくてはいけない、私はこの今回のグローバル COE の一番のポイントとして、意識しているのはやはり人材育成なんですね。この人材育成というのは実はただ専門家を作ればいいということだけではなくて、そういう意識を持った人々のグループを若手の中で育てていくことがいかに大事かということだと思うんです。

ですから、私はこの GIARI という言葉をですね、「義理がある」という「ギアリ」という、あえてそういう言い方をしているんですが、例えば我々のところに今いる若手の Ph.D.の学生とかあるいは助手の人とか、助教の人たちが、我々は GIARI の卒業生なんだと、つまりどこどこの国から来た留学生ではなく、GIARI の卒業生だという意識を持ってくれるような、そういう人材育成になるといいなと思うんですが、そういう試み、原則論で言えば多分賛同していただけると思うんですが、そこらへんもう少し具体的に何かアイデアがあればちょっと教えていただきたい。そ

れから植田先生あたりは京都でそういうような試みを是非やっておられればちょっと紹介していただければと思います。どうもありがとうございました。

松岡：　ありがとうございました。今の発言は拠点リーダーをやっている天児教授です。それではどうしましょうか、順番にでもいいですしランダムにでも結構ですけれども、せっかくチャレンジされましたので寺西さんの方からでもどうですか。よろしいですか？

寺西：　どうもオーストラリアの小林さんという方、それから天児先生どうも。私が最後に申し述べたアジア環境協力は避けられない、これからの共通の課題だと、問題はそれをどう実現していくかなんだけど壁がある。その壁の 1 つの私が破らなくてはいけない最大の壁は国家の論理の壁だということをあえて強調させていただいたのは、私の 20 年のアジアへの環境協力の取り組みの今の私自身の結論というか、私自身の問題の焦点がそこにあるからです。そのことを、1 つ非常に端的に感じるのは、例えば中国は今北京を中心にものすごく環境重視になりました。第 11 次五カ年計画、胡錦涛政権は環境を第 3 の柱にいれています。第 12 次の五カ年計画でも環境投資を、日本で言えば数 10 兆円、50 兆円をやって環境ビジネスを育てると言っています。そういう意味では、ものすごく国家の指導性が発揮され、まさに政府主導型環境配慮計画が出てきているわけだけだけれども。しかしこれは、私はこの国家の論理で進められている中国の環境保全は本当の環境保全につながるのかといったら、極めて怖い、環境の名において行われる新しい環境破壊が起こる可能性があると思っております。西部開発がその典型の現場です。

ところが、こういうことに関して国家の代表で、国家と国家の間で日中環境協力の公式の議論をやろうとしたときには、こういうことをリアリティに基づいて詰めて議論することはできないんですね、残念ながら。制約があります。私は、ヨーロッパの経験の中でライン川がどうして綺麗になったか、というプロセスの中に 1 つのヒントがあるように思います。ライン川はオランダが被害国でドイツ、フランスが加害国です。関係 9 カ国ぐらいがライン川を共通の資源にしていました。航行権も問題になりました。ライン川は 70 年代まで、もう本当にドブ川になったんですね。これを解決するために被害国であるオランダから何回もボールが投げられました。そのためにライン川の河川を汚染防止をするための国際機構が作られました。60 年代初めに。協定に基づいて。これは国家間

協定です。参加したのは全部関係国です。関係国の国家の代表が集まってライン川の防止のための国際委員会が立ち上がったんですが、その委員会は結論的に言えば国家の利害と利害のぶつかり合いの場であって、結局強い国家、フランス、ドイツの利害が貫徹する場所であったにすぎないわけです。

ところが72年のストックホルム会議以降のヨーロッパの環境機構の大きな転換があって、このライン川の国際委員会は委員会のあり方の原理自身を変えました。この委員会に出ているメンバーはドイツから出ているメンバーと言えども、それはドイツの代表ではない。ライン川をキレイにするというミッションに忠実な国際公務員として働くヨーロッパ公務員なんですね。そういう言う意味では、私は植田さんがおっしゃったリージョナルなコモンズを担う担い手が、そのコモンズのミッションを担う人材として国家の枠を越えて活躍する場を作る、そういう機構を作る、これが大事だと思います。その具体的な 1 つのあり方は、例えばですね、APEC とかいろいろな機構を作っていますけど、これは全部国家の代表が閣僚会議とか、閣僚代表が行ったり、あるいは事務次官関係が、事務担当会議に行ったりしていますが、全部国家の利害を背負って、国家の方針に基づいて発言し、会議を調整しています。これとは別の機構を作らなきゃいけないという意味です。

もっと別の意味で新しい機構を作り、そして日本の代表、韓国の代表、中国の代表じゃなくて、例えば、廃棄物管理のプロとして、アジアの廃棄物のよりサステイナブルな管理を担う、そのテクノロジーをきちんと専門的に担える人材として、それをマネジメントする機構を作り、そこでその機構が発言力を持ち、そこの提案が具体化されるように国家に提案されていく枠組みを作らなくてはいけないんじゃないか。これは私の勝手な妄想なんですけれども。そして最後に、天児先生がおっしゃられたように、例えばこの G-COE から育った人たちが、ここから育った、ここで学んだことの専門的で、環境に役に立つ知見をそのものとして活かせるような場をどうやって作れるかということだと思うんですね。これが国家へ戻って、国家の官僚になってしまえば、国家の論理の枠内でしかその専門性を活かせないという制約がかかるんですよね。ですから私は国家の外側に、NGO という言葉で一言言われていますけれども、新しい原理の機構を21世紀は作らなくてはいけない。国家の役割を相対化し、国家の役割の問い直し、国家は別の意味での新しい役割を果たす国家論を作らないといけないと思うんです。

ヨーロッパはおそらく、国民国家の位置づけはヨーロッパ全体の様々

なガバナンスの中のOne of themにだんだんなっているんじゃないかと思います。そういう意味では、従来の国民国家の中央政府がナショナルガバメントとして行う、それが必死になって守ろうとしている国家利害、国民的利害というものの意味がどんどん環境問題の中では相対的に位置が小さくなっていって、より大きなそれを越える共通利益としての環境的利益が最大優先されるような社会作り、機構作り、そしてそれを可能にするルールとか理念というものをどう提起し、それを担う人材と機構を準備していくか。そのための具体的な制度設計と提案が問われているのではないかと思っています。

松岡：　どうもよくしゃべる方にあててしまったようで、ほとんど持ち時間を寺西先生、使っていただきました。ありがとうございました。

寺西：　すみません。

松岡：　それでは時間が押しておりますので、最後残りの方、一言だけおっしゃっていただいて。

寺西：　申し訳ございません。

植田：　今の寺西さんの続きで、もちろんおっしゃった通りと思いますが、アジアのコモンズ、共通の利益を実現する主体形成という問題があるわけですけれども、私が確実に言えると思うのは、国家以外というときはチャネルを多様化するというのがとても大事なことですね。太田さんもおっしゃいましたけど、自治体間協力とか、いろいろなNGOのチャネルとか、すごく多様になってくるということは1つ意味を多分持っているということだと思います。そういうことで、しかしその多様なチャネルに関わっているところが共同の共通認識を持てるような共通体験をするような人材育成をするというのは、価値のある取り組みだと私も理解をしています。

あと実は2つのことだけ簡単に申し上げたかったんですが、1つはこの問題をガバナンスだけで議論するのは僕は十分じゃないという立場です。経済発展のパターンとか経済成長がどういう形で行われていて、どういう分業がなされている、そのことがどういう環境問題を生み出しているかということとの関係で、このガバナンスのあり方を議論する必要がある。それでわざわざ私少しそういうことを申し上げたというのがあ

ります。

それからもう 1 点、みなさんの話を聞いていて思いましたのは、やはり制度という呼び方をするか、レジームという呼び方をするか、いろいろあるんですけれども、これが条約も含めまして進化するという面があるという点です。そういう制度が作られてきて、発展をしていったり、いろいろな形で変わっていく、そこのところのメカニズムについてもう少し知見を得る必要があるんじゃないか、そういうことを課題として感じました。以上です。

松岡： ありがとうございます。それではちょっと植田先生は例の 25%の件で、用事があるようですので。あと簡単に小寺さんから。

小寺： 私は経産省傘下の産業技術総合研究所というところで研究をやっています。国連環境計画は国際機関ではあるのですが、私は研究所からの副業許可のもとで、国連環境計画のために動いています。（これまでの討議で環境政策への国家の意思の影響が強調されていましたが）現在走っている廃プラスチック資源化のためのプラットフォームづくりは、日本の外務省からの資金はもらっているわけですが、日本で比較的自由に動ける人間を個人の資格で糾合してアジア各国との取組みをしています。そういった枠組み（を整備すること）で今後、（開発途上国に導入するに適した）環境技術の持続性評価（SAT）等の取組みを進めていくわけですが、これは（技術提供側の立場で取組みに参加する）技術者や学者、行政官が所属する会社や国家機関のためにではなく、（途上国の現場にいる）地域住民を含む利害関係者にとっての（最適な）評価基準をつくるために活動しています。そうした議論を行う取組みこそ、教育であって、次の世代に残す環境保護の形をどうするかといった教育、（そして同時に）社会啓蒙につながっていくものと思っています。

松岡： ありがとうございます。それではアブさんのほうから。

Aboeprajitno： Thank you. I would like to thank all the discussants, as well as the floor, for your comments and questions on my presentation.

I would only like to briefly respond to Tanaka-san’s comments on what our expected outcome is from the Bali meeting, since it is now still in the planning stage and not ongoing yet.

I would only be able to comment on human health,

sustainable environment free from the potential damaging effects of chemicals.

So in that regard, of course, we have to formulate many more mechanisms, as well as figuring out how to interrelate between parties, as well as forming working groups among the parties such as ASEAN.

I think can comment on that. One little thing on the question from the floor, I think from Kobayashi-san, from Australia: Actually, I do not struggle with the problems like the examples you gave of problems between Singapore and Indonesia or Singapore and Malaysia.

Just as an example, if it were happening, they would go to the secretariat of the Basel Convention, who would listen to both parties, perhaps on the problems that have arisen, and undertake problem-solving efforts.

The only thing that I have seen is that we were also involved in that case, but only taking important notes in our function to further promote awareness on problems. We only acted as witnesses. So we did not struggle with it. But the parties who have problems will struggle. And the problem was solved.

Thank you very much, Mr. Chairman.

松岡： ありがとうございました。太田先生、何かございますでしょうか。

太田： 私もかなり時間を使ってしまったので簡単にいきますけど、自分自身地球環境という言葉をよく使うんですけど、本当はあまりよくなくて、今我々の問題になっているのは人類の生存だと思うんですよね。ですから我々の生存がかかっていることで、ひょっとしたらもう今、いろいろなアルプスとか南太平洋の島々とか、局地に住んでいる人々は本当に気候の変動を肌で感じて、危機的状況だということを認識していると思うんですよ。ところが、一番問題なのは世界人口の 5 割以上を越える我々、都市、都会人で、きっと我々は本当にそうした危機的な状況を全然理解してないと思うし、肌で感じていないと思うんですね。我々はひょっとしたら endangered species、絶滅の危機に瀕する種類、種族じゃないかということを非常に強く思っていまして、制度、制度ときれいなことを言いましたけど、これは地球問題は外にある問題ではなくて、我々の生存

がかかっている。特に、都会に住む我々が一番絶滅の危機に瀕しているんだと思います。お金があるからちょっとは延命するんでしょうけど、そういう意味では、我々はもう少し敏感に動植物とか、あるいは、局地に住んでいる人々の感覚を追体験できるようにしなくてはいけないのかなということを、ここにいて強く感じました。以上です。

松岡：　ありがとうございます。それでは最後に田中先生お願いします。

田中：　ありがとうございます。勤務先と endangered species という意味では、早稲田の方は非常に危険で、私は彦根というところに勤務しているのですが、まあ比較的まだいいかなと、それはさておき、今日の特定のコメントについてというわけではないのですけれども、私も環境条約というガバナンスの一側面からいろいろと環境問題についてアジアの問題を考えておったんですけれども、今日の機会で国家の枠組みをどうするか、あるいは国家では限界があるから国家以外をどうするか。そのときに国家の中でも、国際公務員のように国家の利益を代弁しないような人たちが、ライン川の問題のように、取り組むですとか。やはり欧州ですとか、アジア以外の地域にもいろいろな成功例もあれば失敗例もあって、そういったものをもう少し丹念に精査した上で新しい枠組みというものを今後真剣に考えていく必要があるのではないかな、と思いました。

　また今日のご報告では経済学だけではなくて、理系の方も、また政治学の方ですとか、いろいろな分野からのご報告、コメントをいただいて、やはりこういう問題は学際的に特定の分野によるものではなくて、学際的に文系、理系、様々な学問から、知見を選りすぐって対処していく、そういう問題になるんじゃないかなと思います。私も今後そういうことを研究の面では留意したいと思います。どうもありがとうございました。

松岡：　ありがとうございました。それでは最後にちょっとパネリスト、コメンテーターの方に拍手をしていただきましてこのセッションは終りたいと思います。