Institute for Global Environmental Strategies

➢**Research on Innovative and Strategic Policy Options Second Phase (RISPO II)**

Promotion of sustainable development in the context of regional economic integration: strategies for environmental sustainability and poverty reduction

Case study analysis and Overall conclusion

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IGES Institute for Global Environmental Strategies

Outline

I. Case Study Analysis (in overall context)

II. Overall Conclusions

A. Effects and Implications of Economic Integration

B. Policy Recommendations

C. Analysis of Policy Recommendations

D. Conclusions

I. Case Study Analysis (in overall context)

Overall Research Structure

INTEGRATED QUANTITATIVE AND QUALITATIVE ANALYSIS

ECONOMY-WIDE MODELLING ANALYSIS

(Multi-region computable general equilibrium (CGE))

SECTOR/ISSUE SPECIFIC CASE STUDIES (3)

(Each sector/issue has 1 regional and 4 national cases) (5 x 3 sector/issues = 15 total)

RESEARCH PROCEDURE / POLICY DEVELOPMENT

Step 1: Assess economic & environmental impacts of economic integration

Step 2: Develop environmental policies addressing environmental impacts of economic integration

Step 3: Assess economic, social, & environmental impacts of policies, consider feasibility & implementability (& feed back into Step 2)

Case Studies

Sector		Electrical appliances & electronics/ Automobiles	Agriculture	Energy
Focus		**Inter-boundary Waste & Recycling**	**Organic & Low Input Agriculture**	**Renewable Energy**
Regional Study		●	●	●
National Studies	**China**	●	●	
	Indonesia		●	●
	Japan	●		●
	Korea		●	●
	Thailand	●	●	
	Vietnam	●		●

Link between Modelling and Case Studies

Rationale for using both economy-wide modelling and case study analysis: they provide different perspectives for analysing effects of economic integration and developing policies. For example:

- Modelling can analyse broad, economy-wide policies, like a carbon tax
- Case studies can analyse more narrowly focused policies that cannot be modelled

Concrete linkage:

- Modelling analysis provided quantitative assessment of effects of economic integration on the sectors
  - Waste: electronics, automobiles, nonferrous metals, minerals
  - Energy: electricity, oil, gas; also checked other sectors for energy use
  - Agriculture: rice, processed rice, vegetables, fruits, and nuts, processed food, and livestock
- Modelling analysis provided quantitative assessment of expected effects of selected case/sector-based policies.

Rationale for Selecting Case Study Sectors & Focus

- Sectors were expected to be significantly affected by EI.
- Electronics/autos, energy, agriculture, are all strategic or politically sensitive for many Asian countries.
- Sectors are expected to experience significant negative environmental impacts from integration.
- Selected cases represent opportunities for economic integration to make a positive contribution to solving environmental issues.
- Focus areas may use more market-based policies, and thus may be more feasible or implementable.
- Cases focus on strategic parts of the product life cycle, not just on specific economic sectors.

❖ Country cases represent a range of dimensions including level of economic development, economic structure, size, population, etc.

RISPO-II Case Studies and the Product Life Cycle

Life Cycle ➲ Sector/Focus ⓵	Inputs & Production	Consumption	Disposal
Energy / Renewable energy	●	●	
Agriculture/ OLIA	●	●	
Electronics & Autos/ Waste	● (Clean Production/ Design for Environment)		●

II. Conclusions

A. Effects and Implications of Regional Economic Integration

Effects of Economic Integration -- Context

- Environment is affected by many factors, not just economic integration.
- Effect of past integration was probably large
  - Considering increased trade/openness (early stage of economic integration) was a key factor in rapid economic growth of many Asian countries.
- Projected future economic growth is a more significant cause of expected future pollution
  - This is an important result of our analysis
  - Many of EI's effects result from EI's effects on growth
  - Especially, past EI likely provided a strong basis for future growth
  - => So effects from past growth are already apparent (esp. in case studies)

Economic Effects of Prospective Future Economic Integration – Economy-wide Modelling Analysis - 1

A. Effects on real GDP:
   - Mostly positive in all countries in the study area, ranging from 0 to 3.4%.
   - Trade liberalisation among China, Japan, and Korea under the DEI scenario will benefit all 3 countries, while most ASEAN countries except Malaysia and Singapore enjoy larger GDP gains under the moderate economic integration (MEI) scenario.

B. Effects on real sectoral output:
   - Range from over 100% increase (Vietnam's chemical, rubber & plastics sector) to a 60% decrease (Japan's processed rice sector).

➢ Simulation results may be conservative.
   - The simulation does not include investment liberalisation, which may have greater effects than trade liberalisation.

Environmental Effects of Prospective Future Economic Integration – Economy-wide Modelling Analysis - 2

- Due to forecasted massive increases in economic growth between 2001 and 2020, emissions of all environmental indicators assessed by this research drastically increase regardless of regional economic integration.
- REI aggravates the negative impacts in many cases especially CO2 and air pollution in Vietnam and BOD in Korea (over 10%).

Potential Environmental Effects of Further Regional Economic Integration – Based on Case Study Analysis

Further integration will likely magnify both potential problems and opportunities

A. Examples of problems (confirmed by both quantitative & qualitative analysis)

- Waste/recycling: illegal waste trade/dumping will become even more widespread, especially for waste that is difficult to treat in some Asian countries, such as home appliances and mobile phones, etc.
- Agriculture: lower trade barriers will greatly increase large scale export-oriented agriculture and resulting land degradation & water pollution
- Energy: More REI=> higher economic growth => increased energy use => increased GHG emissions, especially in developing countries which are not very energy efficient

B. Examples of opportunities

- Waste/recycling: can increase trade in recyclables, promote international recycling networks, which in turn can enhance economic efficiency of recycling
- Agriculture: Reduced trade barriers can result in a much larger scale market for organic agriculture, which is a clean production method, lowering costs and enhancing its economic potential
- Renewable energy: increased energy use => increased energy prices => increased economic feasibility of high cost renewable energy; facilitates trade in RE equipment, facilitates technology transfer

Effects of Regional Economic Integration on National Policies (Examples)

- Waste:
  - Increased trade makes operation of domestic recycling difficult
  - Japan example: developed expensive recycling technology & facilities
    - Because of REI, recyclable materials were exported (to get higher price)
    - Japanese recyclers couldn't obtain enough recyclable materials, difficult to ensure economic viability
  - Generally: efficient location for recycling is not necessarily the same as the location of production or consumption.
- Renewable Energy:
  - Prisoners dilemma makes high RE targets difficult
    - RE is comparatively expensive.
    - Some countries are willing to pay higher cost of RE to get benefits (environment or energy security)
    - But paying higher cost for RE hurts trade competitiveness of energy using industries => incentives to keep lower targets
  - Electricity is difficult to trade because of lack of grid interconnection (in contrast to easier movement of capital and goods & services)
    - RE is intermittent, can't serve as base load power, so this limits RE potential

D. Policy Recommendations

Policy Recommendations from Case Studies: 2 Tier Structure

	National Capacity Building	Regional Coordination
Energy	• Increased targets • Regulatory framework • Supply & demand side support policies	• Coordinated increases in RE targets, • Grid interconnection • Technology transfer & Financial assistance • Promote RE as EGS
Agriculture	• Stronger regulation of pesticides, IPM • Contract farming • Green procurement • Coordination with livestock industry	• Harmonized ecolabeling • Stronger coordination on pesticides • Further reduce organic trade barriers, environmental goods & services • Reduce technical barriers to trade
Waste/ Recycling	• Ecotown type recycling industrial park •Enhanced regulatory framework • Data collection	• International recycling zones linking eco industrial parks •Regionally coordinated EPR •Information sharing • Regional certification of recyclers • Respect existing agreements

Policy Recommendations from Economy-wide Modelling Analysis

Policy Packages:	Package A	Package B	Package C
SOX, BOD, COD, SS: • Stricter standards based on Japan's achievements in 1980s • Subsidies for 50% firms' abatement costs	■ (All countries except Japan)	■ (All countries except Japan)	■ (All countries except Japan)
Energy efficiency improvement targets (range from 15%-25%), all countries	■	■	■
C02: • National carbon tax (Japan & Korea only)	■ (Japan & Korea)		
CO2: •Carbon emission trading to achieve carbon reduction target in all ASEAN + 3 (results in uniform carbon price across region)		■	■
Financial assistance • From Japan (USD 200 mil.) & Korea (USD 40 mil.) / year			■

C. Analysis of Policy Recommendations

Policy Recommendations and Economic Integration

- Main objective focused on developing policies to address environmental effects of economic integration.
- However, often, policies to address environmental effects of EI are not necessarily different than other environmental policies.
  - After all, environmental problems have many other causes besides EI, and they will need to be addressed regardless of whether or not there will be more EI.

Value of Considering Economic Integration

- But analyzing environmental effects in the context of EI, shows that EI has important implications, e.g. how EI undermines national policies, or requires international policy cooperation in some cases.

- It was not feasible for this study to create a comprehensive environmental policy for each country. Instead, we focused on:
  - Policies relating to case studies
  - Policies that could be modeled with quantitative analysis

- But future research could explore other types of policies (e.g. air pollution regulations) using this combination of modeling and case study analysis in a more focused way.

Policy Recommendations and EI Scenarios

- Generally, for case studies, appropriate policies were not different depending on the EI scenarios (MEI, DEI). This is because generally, EI affected the magnitude, but not the essential nature of the environmental problems

- Also in cases where EI is expected to affect the operation of policies, the extent of EI affects the magnitude of effect on policies, but not the essential nature of this effect.
  - For example, in RE, more EI worsens the prisoners dilemma, but doesn't fundamentally change it.

- Different sectors may merit higher priority under different scenarios (modelling)
  - For example, EI may affect electricity more than steel
  - But with specific sectors, the overall recommended policy direction does not generally change under different scenarios.

- However, EI scenarios do influence the effects of economy wide policies and sector based taxes/charges/subsidies in the modelling analysis.

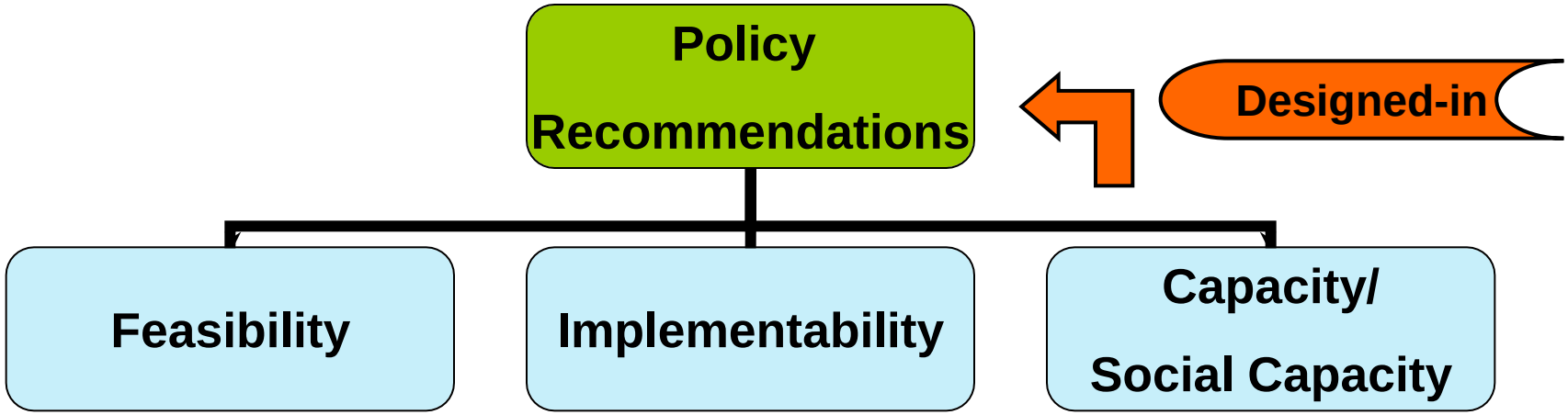
Synthesis of Policy Assessment: Costs & Benefits

- Case studies used a broad “strategic” or policy cost benefit analysis.
  - Rough estimate of cost of policies
  - Rough estimate of benefits of policies (not necessarily monetized)
  - Range of costs & benefits:
    - modest policies => modest benefits => modest costs
    - ambitious policies => higher benefits => higher costs
- Overall: in many cases, significant environmental benefits can be achieved with modest costs.
- Many costs are
  - Administrative, budget increases not large
  - Involve internalization of environmental costs (e.g. producers or consumers pay)
  - Can be paid for with subsidy switching
- Detailed multicriteria anlaysis or complex formal cost benefit analysis was not appropriate or feasible
  - (e.g. data not available)
  - We focused on policies, not projects or specific land areas
- At this stage, policymakers need to know the big picture; detailed analysis is premature. First step is to persuade policymakers to increase priority to environmental considerations in these sectors.

Overview of Analysis of Economy-wide policies

	Policy Package A	Policy Package B	Policy Package C
Environment	○	◎	◎
	Policy packages B and C reduces more pollutant emissions than Policy package A, except for those in Japan and Korea.		
Economy	◎	○	○
	Policy package A increases GDP of each country the most, except for Japan and Korea.		
Poverty	◎	△	○
	Policy package A reduces poverty headcount the most, and Policy package B the least.		
Implementability	○	○	△
	Policy package C requires financial transfer from Japan and Korea to the other members, in addition to regional cooperation for emission trading. Policy package A is free from regional cooperation, but negative impacts on steel sector in Japan and Korea may cause political feasibility problem.		

Synthesis of Policy Assessment: Feasibility & Implementability



- Feasibility, implementability, capacity/social capacity were designed into policy recommendations.
- Key common elements:
  1. Cost: modest or reasonable, commensurate with benefits
  2. Synergies between economy and environment; emphasize economic opportunities from environmental policies
  3. Try to ensure that policies do not significantly disadvantage major stakeholders (strive for win-win policies)

Implementability of Modelling/Economy-wide Policies

- Preliminary analysis
  - Policy packages generally achieved win-win-win results in terms of economic development, poverty reduction, and environmental protection.
  - Overall cost in terms of GDP is low or modest in most cases
  - Effects on politically sensitive sectors (e.g. steel and electricity in Japan) were also more modest than expected.
- Regional coordination mechanism and national capacity building will be important.
- Subsidies may make it easier to achieve stricter standards, especially in developing countries.

➢ More research and analysis are needed

D. Conclusions

Overview of Regional Economic Integration and Environment

- Increased future economic integration in Asia is likely to contribute to:
  1. significant negative environmental impacts
  2. difficulties in implementation or reduced effectiveness of environmental policies.
  3. opportunities to enhance environmental protection and policies.

- Moreover, Asia has already experienced a certain level of economic integration, which has already contributed to these effects.

- Future economic growth is expected to be massive, and will result in significant negative environmental impacts. Past economic integration will likely be an important cause of this economic growth.

- Therefore, policy intervention is highly desirable.
  - Two levels: 1) regional coordination and 2) national capacity building
  - Comprehensive policy packages, not just ad hoc measures

- Economy-wide policies were largely win-win-win in terms of environment, economy, and poverty reduction. Many other effective policies are not very costly. Environmental protection need not come at the expense of economic growth or poverty reduction.

- Cooperation may require more concrete mechanisms or institutionalisation at the regional (or global) level.

Relevance to Actual Policymaking Processes

CURRENT & COMPLETED (WASTE SECTOR)

- ***G8 Environment Ministers Meeting***
  - 3R Initiative (waste case study)
- ***OECD/UNEP Conference on Resource Efficiency April 2008***
- ***ADB/IGES Asia 3R Report March 2008***

FUTURE

- ***Tripartite Environmental Ministers Meeting (TEMM)***
  - Input to the Trade and Environment Working Group
- ***ASEAN + 3 countries negotiations***
  - Ongoing multilateral and bilateral trade negotiations (including Free Trade Areas / Economic Partnership Agreements)
  - Input to negotiations for harmonization of regional environmental standards in ASEAN + 3
  - NEAT (Network of East Asian Thinktanks)
  - ERIA (Economic Research Institute for ASEAN and East Asia)
- ***3R National Strategy Making (waste sector)***
- ***FAO and IFOAM*** (agriculture sector)
  - Input to on-going discussions on harmonization of organic products standards

Publications and Presentations

- Hotta, Y., Elder, M., Mori, H., and M. Tanaka. "Policy Considerations for Establishing an Environmentally Sound Regional Material Flow in East Asia." Journal of Environment and Development. Vol. 17, No. 1, March 2008.
- Kojima, S. and Bhattacharya, A. "Environment Impact Assessment of Future Regional Economic Integration in East Asia." Proceedings of International Symposium of Eco Topia Science 2007, ISETS07, Japan.
- Elder, M., Battacharya, A. and J. Romero. "Economic Integration and Renewable Energy in East Asia: Policy Implications." For presentation and inclusion in the Proceedings of the World Renewable Energy Regional Congress & Exhibition II, 5-7 November 2007, Jakarta, Indonesia.
- Elder, M., Battacharya, A. and J. Romero. "The Puzzle of Japanese Renewable Energy Policy: Why Japan is Lagging and How it Can Catch Up." For presentation and inclusion in the Proceedings of the World Renewable Energy Regional Congress & Exhibition II, 5-7 November 2007, Jakarta, Indonesia.
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- Elder, M. "Contributing to Environmental Objectives through RTAs: Trade in Organic Agricultural Products and Renewable Energy Technologies." Presented at OECD Workshop on Regional Trade Agreements and the Environment. United Nations University, Tokyo, June 19-20, 2007. http://www.oecd.org/document/22/0,3343,en_2649_201185_38503126_1_1_1_1,00.html

Publications and Presentations -2

- Hotta, Y, M. Elder, H. Mori, and M. Tanaka. 2006. "Policy considerations for establishing environmentally sound regional material flow in East Asia." Paper presented at the International Conference on "Sustainable Resource Management, Raw Materials Security, Factor-X Resource Productivity - Tools for Delivering Sustainable Growth in the European Union," Bruges, Belgium, December 6-7.
- Sano, D., Sawhney,□□P., and King, P. 2006. "□□The impacts of introducing eco-labeling to Asia: Opportunities and challenges in promotion of sustainable agriculture." Paper prepared for the International Conference on Greening of Agro-Industries and Networks in Asia: Challenges and Opportunities, Bangkok, Thailand, 27-29 October.

Thank you for your kind attention!

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