

Asia-Pacific Environmental Innovation Strategy Project (APEIS)

RISPO II

Research on Innovative and Strategic
Policy Options Second Phase

Promotion of Sustainable Development in the
Context of Regional Economic Integration : Strategies for
Environmental Sustainability and Poverty Reduction

Institute for Global Environmental Strategies



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1 Introduction

1.1 Unique features of RISPO-II

Research on Innovative and Strategic Policy Options (RISPO), initiated in 2002 as one of the research frameworks of the Asia-Pacific Environmental Innovation Strategy Project (APEIS) and contracted by the Ministry of the Environment of Japan, is a region-wide collaborative research project that seeks to develop policy options to lead the Asia-Pacific region toward sustainable development (<http://www.iges.or.jp/APEIS/RISPO/>). The first phase, RISPO-I, developed a Strategic Policy Options database, a common regional asset to be used as a knowledge-based tool for informed decision-making for sustainable development.

The second phase, RISPO-II, focuses attention on trade and environment issues. More specifically, RISPO-II aims at promoting sustainable development in the context of regional economic integration through the development of strategies for environmental sustainability and poverty reduction.

Currently economic integration in East Asia is accelerating along with a political movement towards the creation of an East Asia Community. Regional economic integration could promote sustainability through generating higher incomes and facilitating clean technology transfer on the one hand, but equally it could cause natural resource degradation due to overexploitation and could harm equity in the region. Policy choices will determine which of these outcomes will emerge as a result of economic integration. Development of appropriate environmental policies that can both mitigate the negative impacts and enhance the positive impacts of regional economic integration is thus an imperative to promote sustainable development in this region. Hence, this is the overall objective of RISPO-II.

(1) Innovative policy development process

To achieve this objective, RISPO-II employs the process outlined in *Figure 1*.

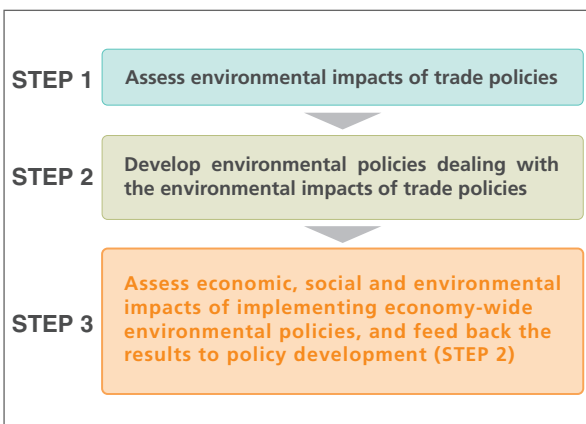


Figure 1 Policy Development Process of RISPO-II

Many of the existing studies on trade and environment issues, such as various environmental impact assessments (EIA) of trade liberalisation, have focused only on the first step. Some studies have utilised the results of EIA in the development of environmental policies dealing with the negative impacts of trade liberalisation, but the potential economic impacts of implementing the proposed environmental policies were not analysed.

From the perspective of sustainable development, however, the lack of impact assessment of environmental policy implementation is a severe drawback. Many “advanced” environmental policies have encountered resistance from the business community mainly because of fear of the potential economic damage due to the impact of competition.

To develop appropriate environmental policies without imposing excessive economic and social costs, STEP 3 in *Figure 1* must be carried out. Accordingly, RISPO-II will go beyond most existing research in the trade and environment literature by taking on this challenge.

(2) Treatment of future uncertainty

Another unique feature of RISPO-II is its treatment of risks associated with future uncertainty about the progress of regional economic integration in East Asia. Environmental impacts caused by regional economic integration will depend largely on the degree of integration. It means that the “best” policy responses are likely to be highly specific to the degree of economic integration. In reality, policy-makers may have to make key decisions before regional economic integration will be realised. This future uncertainty is the intrinsic nature of political decisions, and RISPO-II will explicitly address this uncertainty in the environmental policy development process.

(3) Consideration for policy implementation

RISPO-II places particular importance on the effective implementation of environmental policies. Many developing countries suffer from grave environmental problems not because of any innate inability to introduce proper environmental policies but because of their inability to effectively implement existing policies. RISPO-II will also address this policy implementation issue.

(4) Contribution to actual policy processes

Lastly, RISPO-II is expected to provide policy relevant research outputs to actual policy processes. IGES, the leading institute of RISPO-II, has been involved in various regional and international policy processes which are closely related to trade and the environment. Furthermore, RISPO-II involves six research institutes

which have strong ties with the environmental ministry in each country. Utilising these channels to the existing policy processes, RISPO-II will provide policy-makers with useful inputs for developing adequate environmental policies at the regional and the national levels.

1.2 Scope of the research

RISPO-II confines the scope of policy analysis to environmental policies and regards other policies as external factors. For example, tariff removal from agricultural products may have a significant environmental impact, but this trade policy is regarded as an external factor that cannot be directly controlled by the policy-makers addressed in this research project. RISPO-II will not seek “appropriate” tariff rates of agricultural products, but the possibility of such tariff removal is fully considered and reflected in the background scenarios, on which policy analysis will be conducted (for scenarios, see Sections 2.1 and 2.2).

The target year for completion of regional integration is set at 2020. This medium-term time frame is selected

because a short time frame excludes any significant progress of regional economic integration while a very long time frame reduces the policy relevance of this research project.

The geographical scope of RISPO-II will be “ASEAN (the Association of Southeast Asian Nations) Plus Three”, as shown in *Figure 2*. It includes the 10 members of ASEAN, which are Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam, in addition to China, Japan, and the Republic of Korea, because these countries play a central role in the process of East Asian economic integration.

Among these 13 countries, China, Indonesia, Japan, the Republic of Korea, Thailand, and Vietnam were selected for case studies. These six countries were selected with a view to reflecting the diversity of East Asia in terms of economic and social development, priority environmental concerns, and adequate geographical representation of the sub-regions of Northeast and Southeast Asia. Among the ASEAN countries, Indonesia, Thailand, and Vietnam were selected in order to reflect the different levels of socio-economic development and the varied environmental concerns within ASEAN.

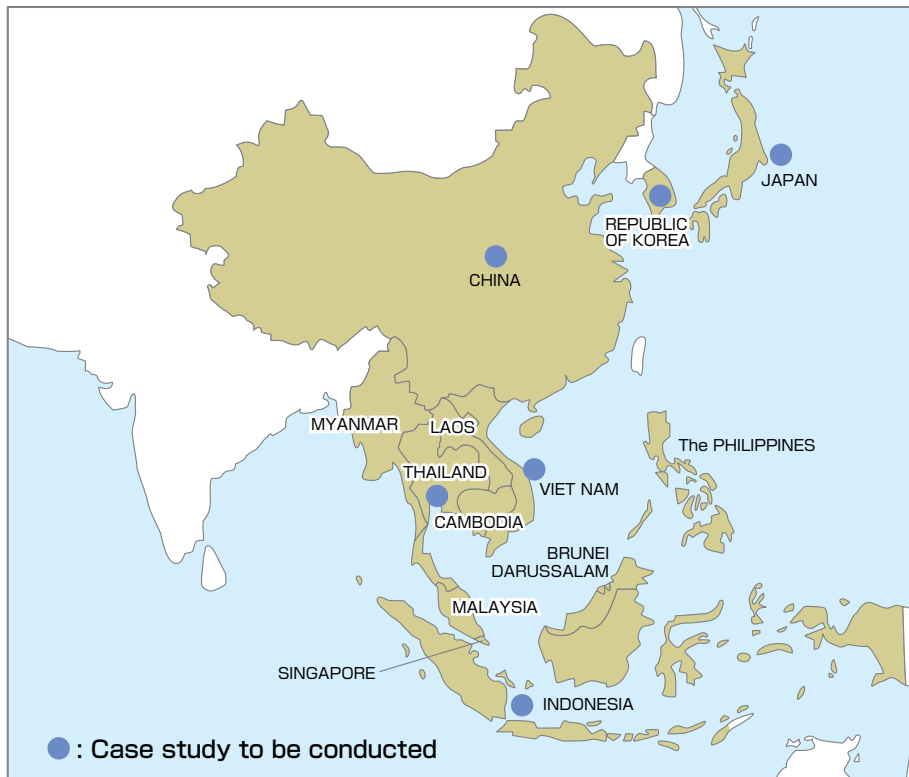


Figure 2 Study Area Map

1.3 Research questions

The central research question of RISPO-II is presented as follows:

What are the environmental policies that will promote synergies between economic development, environmental protection, and poverty reduction in the context of economic integration in East Asia?

There is no unanimously agreed definition of sustainable development. Furthermore, it seems impossible for environmental policies alone to achieve sustainable development based on any well-known definitions, such as maintaining a stock of man-made, natural and social capital, or eradicating poverty without exceeding ecological carrying capacity. This is why the project objective is to develop a set of environmental policies **promoting** (not “achieving”) sustainable development. We assume that sustainable development is promoted when a set of environmental policies achieves pre-specified policy targets in environmental, social, and economic aspects simultaneously, or at least significantly narrows the gap between the targets and the business as usual (BAU) outcomes. More specifically, RISPO-II seeks a set of environmental policies such that:

- (a) no East Asian countries will become pollution havens;
- (b) technology transfer improving resource and energy efficiency will be facilitated;
- (c) environmental policy will not worsen poverty in East Asia;

- (d) environmental governance will be promoted and strengthened over time; and
- (e) environmental protection will not impose high social and economic costs.

1.4 Organisational structure

RISPO-II will be conducted by a core group consisting of:

- Institute for Global Environmental Strategies (Japan)
- Korea Environment Institute (Korea)
- McGill University (Canada)
- National Institute for Environmental Studies (Japan)
- UNEP- Environment and Trade Bureau (Switzerland)

The Institute for Global Environmental Strategies (IGES) will serve as the leading agency of the project. The core group will closely collaborate with the following partner institutes covering the remaining case study countries:

- Economic Research Center, Indonesian Institute of Science (Indonesia)
- Institute for Environmental Science and Technology, Hanoi University of Technology (Vietnam)
- Policy Research Center for Environment and Economy, State Environmental Protection Administration (China)
- Thailand Environment Institute (Thailand)

In addition, a group of selected resources institutes and experts will advise and assist the core group during implementation of the project.

The organisational structure is shown in **Figure 3**.

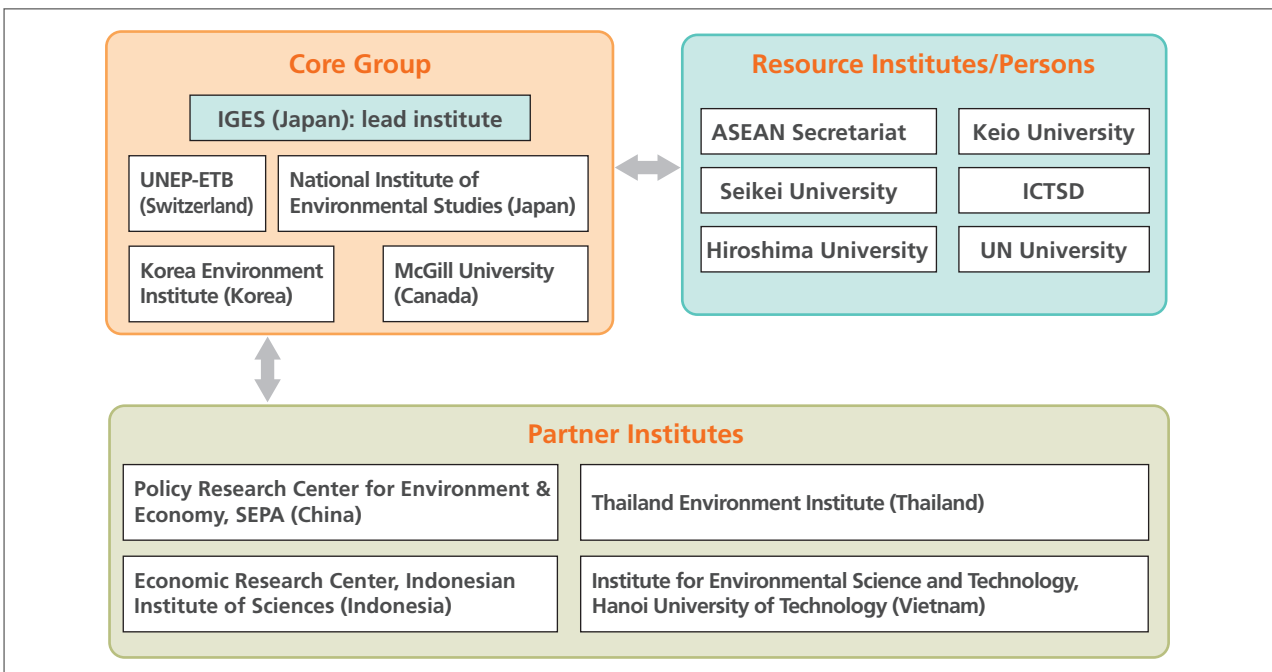


Figure 3 Organisational structure

2 Methodological Framework

2.1 Innovative features of the methodology

The unique features of RISPO-II mentioned above can be summarised as follows:

- Environmental policy will be developed based on a feedback process in which the environmental, social and economic impacts of implementing a set of environmental policies are assessed and the assessment results are utilised to improve the set of environmental policies.
- Risks associated with future uncertainty about the progress of regional economic integration in East Asia will be explicitly addressed in the environmental policy development process.
- Implementability of the developed environmental policies will be explicitly addressed.

RISPO-II employs an innovative analytical framework in which the above unique features are materialised as follows:

An economy-wide policy analysis based on the Global Trade Analysis Project (GTAP) model and other quantitative models will be carried out in order to quantitatively assess not only environmental impacts due to regional economic integration but also environmental, social and economic impacts of implementing a set of environmental policies (See Section 2.3).

A scenario approach will address future uncertainty about the degree of regional economic integration, in which the future regional economic integration of the target year will be represented as

a set of scenarios including two extreme cases within the plausible range of future regional economic integration. This scenario approach can reveal how environmental impacts vary depending upon the degree of future economic integration, and it can clarify risks due to uncertainty about future economic integration, without predicting or forecasting the future. The scenarios in RISPO-II will describe the background or context of environmental policy development from which environmental policies are deliberately excluded, which is analogous to the Emissions Scenarios of the Intergovernmental Panel on Climate Change (See Section 2.2).

A sector/issue specific policy analysis, which focuses on a few specified sectors/environmental issues, will address the issue of effective policy implementation. Sector/issue specific policy analysis in RISPO-II will employ various qualitative policy analysis techniques and is confined to a few selected sectors/issues in order to allow in depth analysis (See Section 2.4).

These elements will constitute an integrated policy analysis for the development of environmental policy options as shown in *Figure 4*.

2.2 Scenario approach for future uncertainty

There are various external drivers which may significantly affect the performance of a set of environmental policies. For example, different

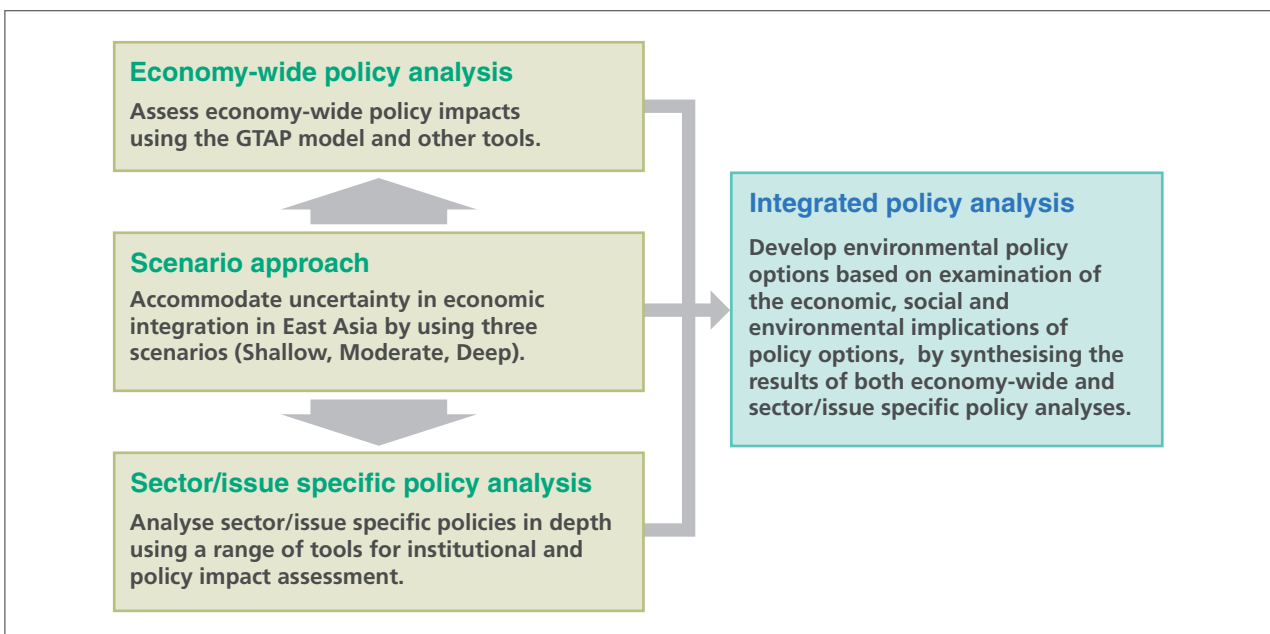


Figure 4 Innovative analytical framework

demographic dynamics or climate conditions set a totally different context in which environmental policies must perform. RISPO-II, however, particularly focuses on alternative states of regional economic integration in East Asia. Population growth and technological change are included as drivers in the scenarios, but dynamic interactions between these drivers and economic integration are not considered. The justification is twofold. Firstly, it is extremely difficult to determine plausible ranges of other exogenous drivers which may interact with each other in a consistent way. Secondly, it allows us to conduct comprehensive assessments of more policy packages, in which we are most interested.

Therefore, the scenarios of RISPO-II describe the images of future degrees of economic integration. They are not the same scenarios used in existing global assessments such as UNEP's Global Environment Outlook (GEO) process since RISPO-II scenarios exclude environmental policies. This exclusion is important in order to formulate environmental policy responses since it enables the separation of the effects of environmental policies from those caused by economic integration.

The process of regional economic integration in East Asia has already started with the conclusion of bilateral and multilateral economic partnership agreements between some constituent countries. However, the establishment of an East Asia Community has not been implemented so far. Under such circumstances, it is highly plausible that the actual state of economic integration in 2020 will be somewhere between the status quo and the full integration pursued by the East-Asia Community concept. In addition, it is useful to have a scenario between these two extremes for refining a policy analysis resolution. RISPO-II employs three scenarios labelled as "Shallow Economic Integration (SEI)", "Moderate Economic Integration (MEI)" and "Deep Economic Integration (DEI)", respectively.

The SEI scenario assumes that the Doha Round of Multilateral Trade Negotiations ends in failure, and no further liberalisation occurs at the multilateral level. Within East Asia, economic liberalization remains stagnant and no further liberalization takes place from the base year of the trade data base — 2001. Although some liberalization has taken place after 2001, updating trade barrier data to a more recent year requires huge amount of work but generates no tangible benefits. The role of the SEI scenario is to represent the shallowest level of economic integration. The scenario based on the 2001 data is safer than that based on more recent trade barrier data.

The MEI scenario assumes that the ASEAN Free Trade Area (AFTA) is fully implemented and is progressively extended to China, Japan and Korea through the conclusion of bilateral agreements between ASEAN and each of the three countries

(essentially merging 3 rounds of ASEAN+1). At the same time, the Doha Round achieves some degree of success in parts of its liberalisation agenda. However, several significant tariff and non-tariff restrictions are maintained in all segments of trade and investment within East Asia, especially within sensitive sectors.

The DEI scenario assumes that agreement is reached on all aspects of the Doha Round, while East Asian countries embark on full economic liberalisation. All countries apply full national treatment on a reciprocal basis, for all segments of regional trade and investment, with only limited tariff and non-tariff restrictions remaining in a few sub-sectors of agricultural trade. The Japan-Singapore Agreement for a New Age Economic Partnership (JSEPA), which appears to be the most far-reaching agreement concluded so far within East Asia, both in terms of trade liberalisation and trade facilitation, is postulated as a baseline and model for the DEI scenario, but falls short of the ultimate achievements under DEI.

For the MEI and DEI scenarios, it is assumed that commitments to economic liberalisation and tariff and non-tariff restrictions for the East Asian economic partnership agreement (EPA) will not be less than what is expected to be achieved under the Doha Round of multilateral trade negotiations, as well as what has already been agreed in existing multilateral and bilateral EPAs concluded among East Asian countries.

2.3 Economy-wide policy analysis

(1) Necessity of a multi-regional trade analysis model

Economy-wide policy analysis of RISPO-II will provide two types of economy-wide impact assessment. One is environmental impact assessment of regional economic integration, which corresponds to STEP 1 of **Figure 1**, and the other is impact assessment of environmental policy implementation, corresponding to STEP 3 of **Figure 1**. Regional economic integration will trigger extensive economic repercussions through interactions between countries as well as between industrial sectors. Assessment of the economy-wide impacts of regional economic integration thus requires an analytical tool that can address these complex international and inter-sectoral interactions. This is why RISPO-II employs the GTAP model, a widely used multiregional trade analysis model, as the main tool of economy-wide policy analysis.

The GTAP model consists of a global database that compiles individual countries' input-output tables and trade related data such as bilateral trade flows and trade barriers, and a standard modelling tool to handle this large database. RISPO-II utilises the latest version (version 6)

of the GTAP model and database which disaggregates the world into 87 countries (or regions) with 57 industrial sectors such as electricity, forestry and textiles sectors. The latest version of the GTAP database corresponds to 2001, and it is thus necessary to adjust the data reflecting the projected changes towards the target year 2020. This database adjustment will be done using a recursive updating approach in which the GTAP model will be run in time steps using existing projections of important drivers such as population and GDP. Some important drivers without existing projections, for instance production capacity (capital accumulation) in each industrial sector, will be calibrated such that the projected GDP path can be reproduced.

(2) Environmental impact assessment of regional economic integration

Environmental impact assessment of regional economic integration will be conducted by translating economic impacts of regional economic integration into environmental impacts, such as emissions of CO₂, SO₂, biochemical oxygen demand (BOD), or total nitrogen (TN). The simplest method of translation is to multiply changes in industrial output by environmental coefficients. For example, if the environmental coefficient of CO₂ from the electricity sector in Japan is 0.32 g CO₂ per one dollar of output, and economic integration increases this sector’s output by \$12.5 million, then the resulting environmental impact would be:

$$\text{Environmental impact} = 0.32 \text{ [g of CO}_2\text{/\$]} \times 12.5 \text{ [Million \$]} = 4.0 \text{ [tons of CO}_2\text{]}$$

Figure 5 illustrates the environmental impact assessment of regional economic integration in RISPO-II.

This assessment is conceptually simple since it can be done once environmental coefficients are available. This is largely why many previous studies on trade and environment conducted this kind of assessment. Nevertheless each environmental indicator will have to be estimated for each industrial sector in each country. This will require a substantial effort regarding data collection and could be limited by the availability of data.

(3) Impact assessment of environmental policy implementation

Economy-wide impact assessment of environmental policy implementation is the most innovative but challenging part of RISPO-II. In addition to direct positive environmental impacts through the reduction of environmental coefficients, environmental policies will have repercussions on economic performance which, in turn, have indirect environmental impacts as well as social impacts.

The former “direct channel” can be addressed by modelling the relationship between environmental policies and resulting levels of environmental coefficients. Addressing the latter “indirect channel” via economic impacts, however, requires modification of the GTAP model and the database. This is a real challenge even though there are several precursors such as GTAP-E, a modified version of the GTAP model in which energy substitution between coal, oil and natural gas is introduced in order to assess the impacts of several climate change policies such as carbon tax and tradable permits. Since RISPO-II aims to develop adequate sets of environmental policies addressing a wide range of environmental problems, the modified version of the

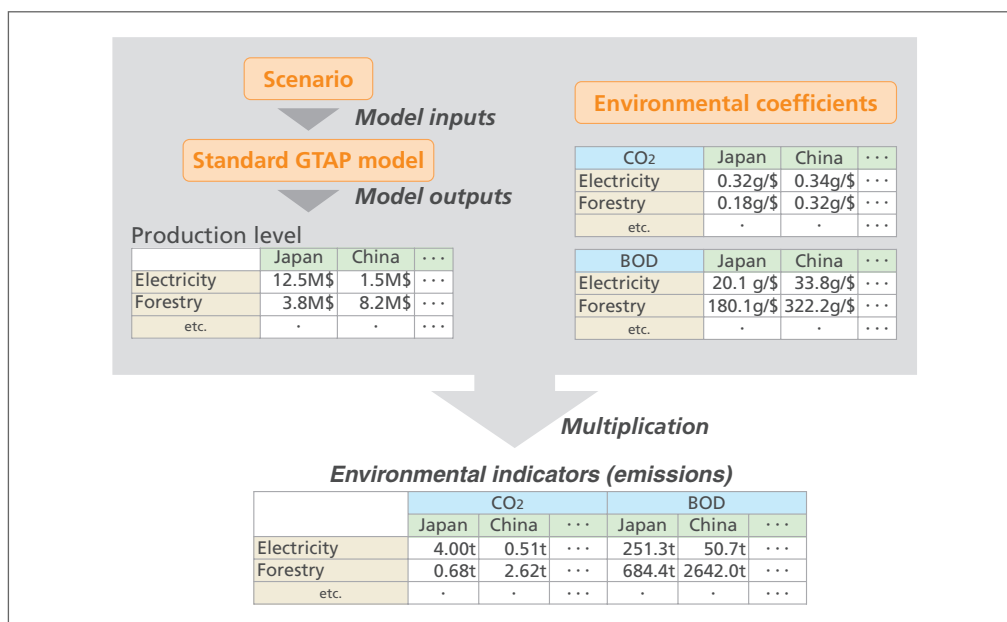


Figure 5 Environmental impact assessment of regional economic integration

GTAP model must be able to assess the economic impacts of various environmental policies at once. There are certainly strong limitations in the range of policies that can be addressed by the modified GTAP model, and this is one of the reasons why RISPO-II needs to involve in-depth sector/issue specific policy analysis.

Once the modified GTAP model and the relationship between environmental policies and resulting levels of environmental coefficients are developed, environmental impacts due to implementing a set of environmental policies can be assessed as illustrated in **Figure 6**.

Assessment of social impacts will be done in a similar way, but it requires another quantitative tool, a social accounting matrix (SAM) of each country. A SAM is an extended input-output table which includes transactions among institutions such as households and the government, and it traces how changes in sectoral production levels affect income distribution among different household classes. **Figure 7** illustrates the social impact assessment by coupling the modified GTAP model with a SAM. Economic indicators such as GDP will be assessed directly by the modified GTAP model.

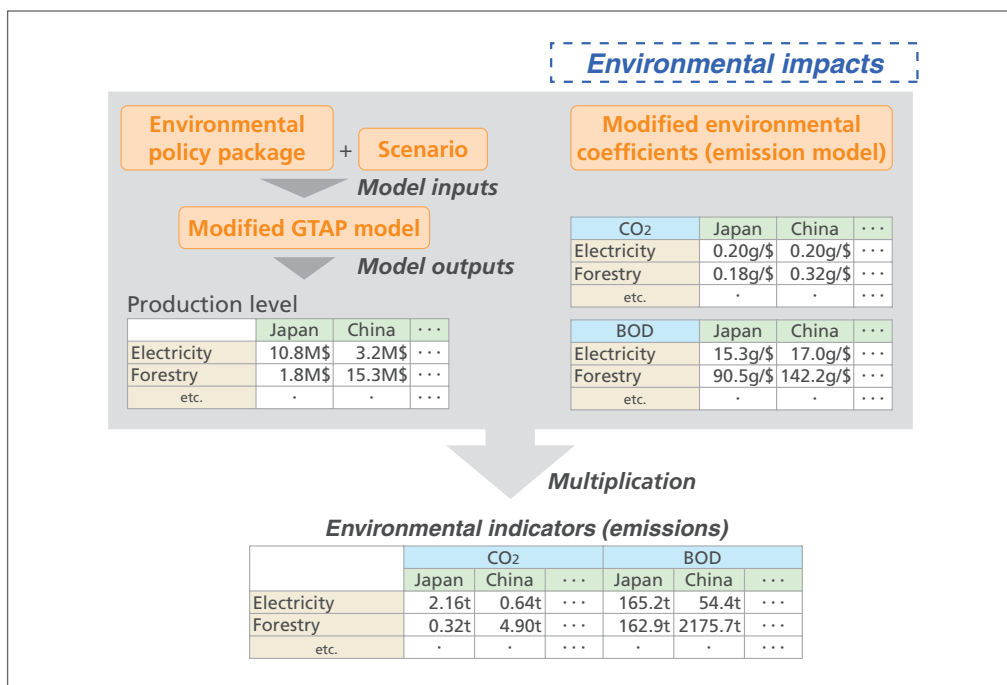


Figure 6 Environmental impact assessment of environmental policies

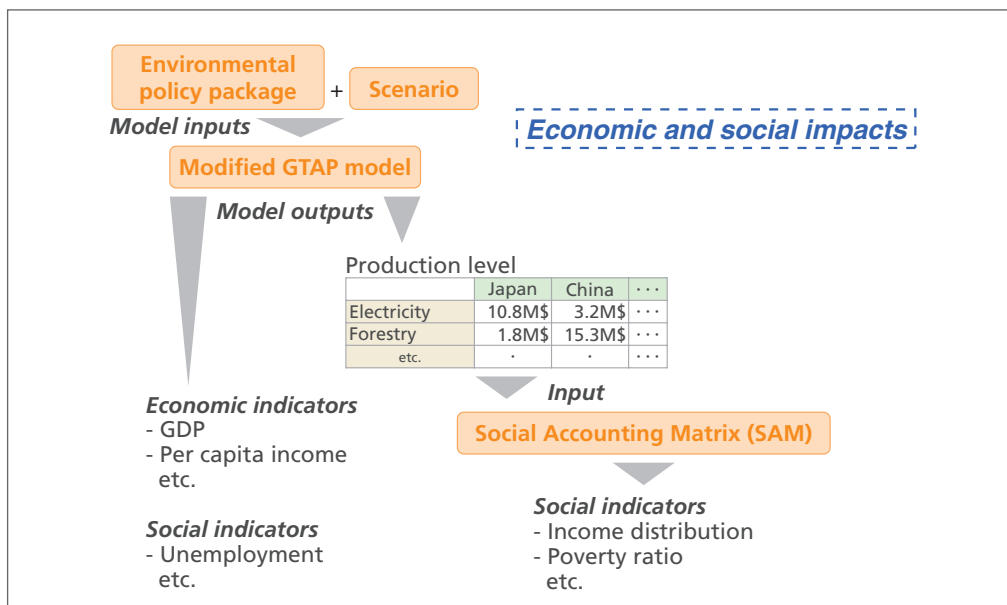


Figure 7 Economic and social impact assessment of environmental policies

2.4 Sector/issue specific policy analysis

Sector/issue specific policy analysis in RISPO-II plays a crucial role, particularly in (i) the detailed impact assessment of environmental policies which cannot be handled by the economy-wide policy analysis, and (ii) the institutional assessment which will address the issue of effective policy implementation. Fulfilment of these objectives requires in-depth qualitative analysis which has a corresponding limitation in terms of coverage of sectors/issues.

Based upon an extensive literature review, the following analytical sequence and methodologies were selected to carry out sector/issue specific policy analysis at both the regional and the national levels.

(1) Selection of priority sectors and issues

To identify the limited number of sectors/issues to be covered by this analysis, the following selection criteria were adopted:

For the selection of sectors:

- The sector relates directly to major environmental media and natural resources;
- The sector would be subject to changes in the economic rules set by regional economic integration;
- The sector is likely to experience changes in trade when regional economic integration takes place;
- The sector is likely to involve new inflows of foreign investment; and
- Structural changes as a result of regional economic integration may see the sector expand or retract.

For the selection of issues:

- The issue covers major trade related environmental policies in a well-balanced manner;
- The issue reflects not only individual countries' environmental concerns but also regional environmental concerns; and
- The issue has different policy implications depending on the development levels of countries in East Asia.

Based on these criteria, the priority sectors and issues were selected as shown in *Table 1*.

This arrangement makes it possible to examine the trade

related environmental policies in a more holistic manner as well as comparing policy responses between countries.

(2) Identification of environmental impacts

As there are many environmental concerns within each issue, critical issues will be further analysed and "screened" to ensure that the case studies at the national and the regional levels reflect the complexity of the issues but at the same time illustrate major points regarding the impacts of regional economic integration. For this purpose, RISPO-II employs Causal Chain Analysis (CCA).

CCA is a means of tracing the immediate or direct causes of an impact or problem back to its root causes. Often the immediate cause of an impact is not its fundamental cause. Tackling the direct cause may not solve the problem; tackling the root cause may solve more than one problem. This approach follows a logical progression beginning with economic effect. It identifies the cause and effect linkages between the trade measure and its consequent economic effects and then the social and environmental impact of this economic change. CCA merely draws out logical connections between causes and effects and makes no attempt to quantify the impacts or evaluate the costs and benefits of the possible responses.

(3) Estimation of extent of impacts

For the selected issues, the CCA will identify the key economic and social impacts of the two extremes of the scenarios. For these impacts, two critical analyses will be conducted: environmental impact assessment and analysis of policy responses. Cumulative environmental impacts in the selected sectors/issues for at least two boundary scenarios (SEI and DEI) will be assessed using the Cumulative Impact Assessment (CIA), so that scenario-specific policy responses can be crafted for the potentially most damaging impacts.

CIA addresses the weaknesses of the project specific Environmental Impact Assessment (EIA) approach by extending the analytical tool to policies, plans and programs and is an analysis of all effects on an area from one or more activities as they accumulate over

Sectors	Electrical appliances and electronics/automobile industry	Agriculture/agro-forestry	Energy
Issues	Inter-boundary waste recycling	Eco-labelling for organic and low-input agriculture	Technology transfer for renewable energy
China	●	●	
Indonesia		●	●
Japan	●		●
Korea		●	●
Thailand	●	●	
Vietnam	●		●

Table 1 Selected priority sectors and issues

time and space. Strategic Environmental Assessment (SEA) is best understood as a continuum of approaches from simply extending the EIA approach to a specific plan or program to conducting more comprehensive cumulative impact assessments or sectoral impact assessments, where the combined effects of multiple actions or policies in a geographic area or a sector are analysed. CIA also requires some form of valuation of different types of environmental impacts or ranking using a common metric so that scenario outcomes can be compared.

(4) Selection of policy responses

Once the key environmental impacts have been identified and their cumulative effects quantified to the greatest extent possible, the project will identify a range of possible policy responses that could mitigate the impacts. Policies will be drawn from best practice literature, including RISPO-I, and will try to cover broad policy classifications such as command and control, market-based instruments, voluntary agreements, informational regulation, and direct intervention. Different policy sets (i.e. a policy mix, where several policies may work synergistically) may be formulated, as appropriate to each sector, and each scenario.

(5) Assessment of policy effectiveness

Assessment of policy effectiveness requires not only an evaluation of how the policy would mitigate the environmental damage but also an assessment of the institutional and social capacity to implement and enforce the policies so that the intended outcomes are achieved. For evaluating policy effectiveness, Benefit-Cost Analysis (BCA) and/or Multi-Criteria Analysis (MCA) which employ the comparative analysis of policy responses and environmental mitigation will be utilised.

BCA is a framework that allows the monetised costs and benefits of an activity, project, or policy to be compared. It is a useful way of converting all the information relevant to the assessment of a proposed action into a comparable and easily understood form.

The main difficulty is putting a monetary value on environmental and social costs and benefits for which no market prices generally exist. Some form of shadow pricing for both marketed and non-marketed commodities and services therefore becomes necessary. The end product is a measure of the present value of aggregate net benefit of the policy. BCA can be undertaken before, after or during project implementation. An ex-ante analysis can help determine whether a policy should be pursued or not, while ex-post analysis is valuable as a learning exercise. BCA has so far been used mostly at the project level.

MCA where trade-offs between conservation and development goals exist, or no market (or quasi-market) exists, multi-criteria analysis (MCA) attempts to take into account the preferences of stakeholders in the use of natural and environmental resources. The process is participatory, as stakeholders themselves make decisions about how the environmental resource should be managed. These decisions are arrived at by identifying alternative options for the use of the resource, together with a set of criteria to be used in evaluating the options, and by setting weights for each criterion. The most important criteria used in MCA include economic efficiency (measured in terms of the net present value of goods and services produced, and the value of the environmental services); distributional impact (incidence of costs and benefits by socio-economic group, stakeholder, or by geographic area); employment; social acceptability; sustainability; biodiversity, and environmental impacts. The process requires ranking the various options using combinations of quantitative and qualitative marks, and putting weights on the various criteria. MCA's main advantage is its ability to identify and resolve conflicts among the various stakeholders over a particular resource or environment, or a policy under consideration.

(6) Assessment of institutional capacity

Since there are many policy options that could effectively mitigate any particular environmental impacts or enhance positive impacts, the difference between them often rests with the implementation capacity of the responsible actors (governments, firms, and citizens), so that the intended outcomes (environmental quality and poverty reduction) can be achieved. Although methodological approaches for this type of analysis are not as well developed as for environmental impacts, social capacity assessment (SCA) will be conducted.

SCA examines the capacity of three major actors (government, firms, and citizens) and the interrelationships between them. SCA posits three stages of institutional capacity development – a system-making stage; a system-working stage; and a self-management stage, and assumes that institutional capacity evolves along this continuum. SCA uses benchmarks and indicators to determine where each set of institutions is located in terms of the three stages. At the system-making stage, command and control policies may be more suitable as there is no common understanding between the government, firms and citizens. At the self-management stage, more voluntary approaches may be suitable as there is a well-established relationship between three actors and a common understanding of what environmental actions need to be taken.

3 Expected Outcomes - Strategic Environmental Policy Options (SEPO)

3.1 Future uncertainty and strategic environmental policy options

RISPO-II facilitates the decision making process by providing relevant information which takes into account risks associated with future uncertainty about the progress of regional economic integration. RISPO-II can provide not only environmental policy packages but also their assessment results under various scenarios which will help identify potential risks associated with possible policy options. In this project, the combination of an environmental policy package with its assessment results under various scenarios is termed a **Strategic Environmental Policy Option (SEPO)**. SEPOs will be useful inputs for policy-makers in developing environmental policies that can accommodate risks due to future uncertainty, especially where environmental considerations are raised by country teams negotiating economic partnership agreements.

3.2 Image of outcomes

(1) Image of environmental policy packages

In the course of research activity, two types of environmental policy packages will be analysed in parallel: one is sector/issue specific policy packages, and the other is economy-wide policy packages (see *Figure 8*). The former will cover only a limited number of environmental issues relevant to selected industrial sectors but a wide range of policy instruments can be involved, while the latter will cover all industrial sectors and all the major environmental issues but only for policy instruments which can be analysed in the model.

Sector/issue specific environmental policy packages are expected to provide policy implications, including their

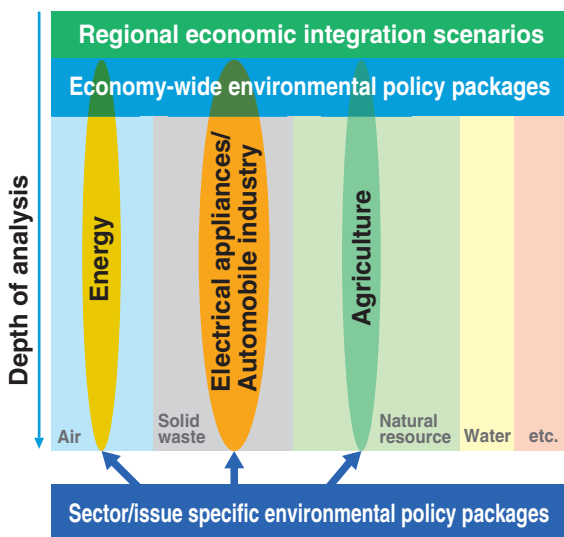


Figure 8 Two types of environmental policy packages

implementability or necessary institutional mechanisms for their effective implementation. Economy-wide environmental policy packages are expected to reveal the economy-wide impacts, not only environmental but also social and economic consequences, of environmental policy packages. The two types of policy packages complement each other and can be synthesised to develop SEPOs, which not only have positive economy-wide environmental, social and economic impacts but also can be effectively implemented.

Consequently, SEPOs will cover all the important environmental issues and may combine various policy instruments for each issue. For example, a policy package in a country may include;

- 100\$/ton of carbon tax
- EURO3 standards for vehicle emissions
- 20% increase of pollution charges of wastewater
- A subsidy for environmentally friendly technology transfer
- The promotion of eco-labelling for agricultural products

The modelling analysis in RISPO-II will reflect the transboundary effects of implementing a policy package in one country, which has impacts not only in that country but also on other economies. Consequently, the policy packages subjected to modelling analysis are, therefore, a combination of each case study country’s policy packages. Of special interest to the project are environmental policy packages that include some harmonised regional policies and can achieve the regional policy targets as well as the national targets of each constituent country.

(2) Image of assessment results

RISPO-II entails two types of policy assessment; impact assessment which evaluates the expected outcomes of policy packages assuming they are effectively implemented, and institutional assessment which evaluates the implementability of policy packages.

Impact assessment results constituting SEPOs will heavily rely on the results of modelling analysis. Impacts of policy instruments which cannot be addressed by modelling analysis will be assessed by generalising policy implications obtained through qualitative policy analysis for sector/issue specific policy packages. The impact assessment results of a policy package under, say, DEI scenario may look like:

- reduction of SO₂ emission: 43% in country A, 5% in country B, ...
- reduction of BOD discharge: 14% in country A, -3% in country B, ...
- average annual GDP growth rate: 0.2% in A, 0.9% in B, ...
- reduction of poverty ratio such as the ratio of the population subsisting on less than one dollar per day: 25% in A, 32% in B, ...

- food safety due to promoted organic food: negligible in A, significant in B,

Institutional assessment will exclusively rely on qualitative policy analysis for sector/issue specific policy packages, with adequate generalisation to address the implementability of economy-wide environmental policy packages. The results of institutional assessment will be fed back to the policy package development process in order to secure the implementability of environmental policy packages, and those expressed in the final outcome may take the form of institutional recommendations rather than a rating of implementability. For example,

- country A needs to enhance the monitoring capacity to effectively implement a pollution charge system for industrial wastewater.

- country B has enough institutional capacity to introduce \$100/ton of carbon tax.

Needless to say, the results of the impact assessment as well as institutional assessment will depend on scenarios.

(3) Image of strategic environmental policy options

Table 2 illustrates the image of a SEPO.

This is just a sketch of a SEPO, and actual SEPOs will be much more comprehensive in terms of the coverage of both policy instruments and performance indicators. RISPO-II is expected to provide a number of SEPOs with different risk implications.

SEPO-A		East Asia region	Country A	Country B	etc.
Policy packages	Environmental taxes		100\$/ton carbon tax	- 20\$/ton carbon tax - 10\$/kg BOD discharge fee	...
	Environmental standards	Harmonisation of vehicle emission standards	- 20% stricter SO ₂ standards - WHO water quality standards	None	...
	Environmental investment			Earmarking revenue of BOD discharge fee to industrial wastewater treatment	...
	Environmental certificate	Eco-labelling for agro products			...
	etc.	...	...	...	...
Assessment results under DEI	CO ₂ reduction	5.2%	12.8%	3.4%	...
	SO ₂ reduction	14.7%	54.1%	1.2%	...
	BOD reduction	16.2%	-2.9%	63.0%	...
	GDP growth	0.34%	0.01%	0.83%	...
	Food safety improvement	Significant	Negligible	Significant	...
	etc.	...	...	...	...
Institutional assessment	There are no significant institutional barriers to implement these regional policies under DEI.	There are no significant institutional barriers to implement these regional policies under DEI.	Need to enhance monitoring capacity to effectively implement pollution charge system for industrial wastewater.	...	
Assessment results under MEI	CO ₂ reduction	8.5%	21.8%	2.4%	...
	SO ₂ reduction	16.7%	61.0%	3.3%	...
	BOD reduction	20.4%	7.6%	72.3%	...
	GDP growth	-0.05%	-0.14%	0.05%	...
	Food safety improvement	Negligible	Negligible	Negligible	...
	etc.	...	...	...	...
Institutional assessment	Environmental cooperation in NE Asia must be improved for effective implementation of these regional policies under MEI.	There are no significant institutional barriers to implement these regional policies under MEI.	Need to enhance monitoring capacity to effectively implement pollution charge system for industrial wastewater.	...	
Assessment results under SEI	...	...	...	...	...

Table 2 Image of a strategic environmental policy option

4 Contribution to Existing Policy Processes

As strategic policy research, RISPO-II is expected to provide useful inputs to actual policy processes. To this end it is necessary to disseminate policy relevant outputs to policy-makers, particularly those in the study area, through effective policy dialogue channels.

RISPO-II is being conducted by research institutes from six case study countries, each of which has strong ties with the environmental ministry of their country. In addition to these national channels, IGES, the lead institute of RISPO-II, has been involved in the following regional/international policy processes related to the project:

Network of Institutions for Sustainable Development under the United Nations Environmental Programme (UNEP-NISD)

NISD is a network of national training and research institutes, regional organisations, universities, and international and non-governmental organisations (NGOs) established under the initiative of UNEP's Economics and Trade Branch (UNEP-ETB). It aims at enhancing information exchange, capacity building, outreach activities, disseminating existing materials on trade and economic-related issues and acting as a catalyst for new initiatives.

National performance assessment and a strategic environmental framework for the Greater Mekong Sub-region (SEF II)

The Strategic Environmental Framework (SEF) Project was created to help the Asian Development Bank make funding decisions about infrastructure projects in the Greater Mekong Subregion. In the second phase (SEF II) a core set of indicators, methods, and tools for assessing environmental performance was developed.

These policy processes offer some opportunities to present research outputs to policy-makers. However, IGES will also ensure that trade negotiators are provided with the outcomes of the study and will be able to follow up any concerns that are raised regarding environmental policy as a barrier to trade liberalisation, or the consequences of trade proposals on environmental quality in the region.

Collaborating Institutes

- Economic Research Center, Indonesian Institute of Sciences (Indonesia)
- Institute for Global Environmental Strategies (Japan)
- Institute for Environmental Science and Technology, Hanoi University of Technology (Viet Nam)
- Korea Environment Institute (Korea)
- McGill University (Canada)
- National Institute for Environmental Studies (Japan)
- Policy Research Center for Environment & Economy, State Environment Protection Administration (China)
- Thailand Environment Institute (Thailand)
- UNEP Division of Technology, Industry and Economics/Economics & Trade Branch (Switzerland)

Advisory Institutes

- ADB (Asian Development Bank)
- ASEAN Secretariat
- Hiroshima University (Japan)
- Keio University (Japan)
- UNEP/ROAP (United Nations Environment Programme/Regional Office for Asia and the Pacific)
- UNESCAP (United Nations Economic and Social Commission for Asia and the Pacific)
- UNU (United Nations University)



Kick off meeting (21-22 November 2005 at IGES HQ)

Research on Innovative and Strategic Policy Options (RISPO-I)

URL: <http://www.iges.or.jp/APEIS/RISPO>

Research on Innovative and Strategic Policy Options II (RISPO-II)

URL: http://www.iges.or.jp/en/ltp/activity_rispo2.html