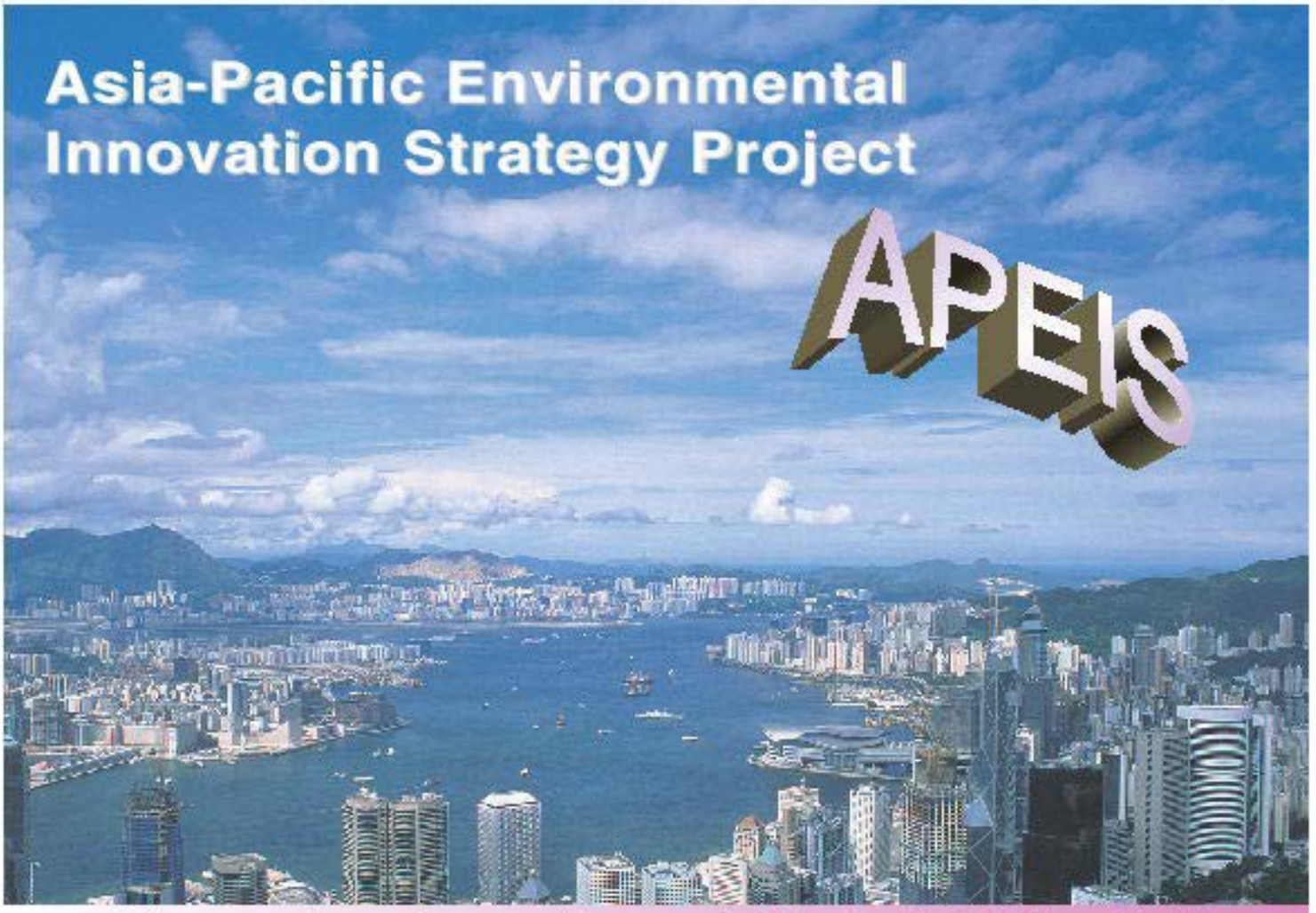
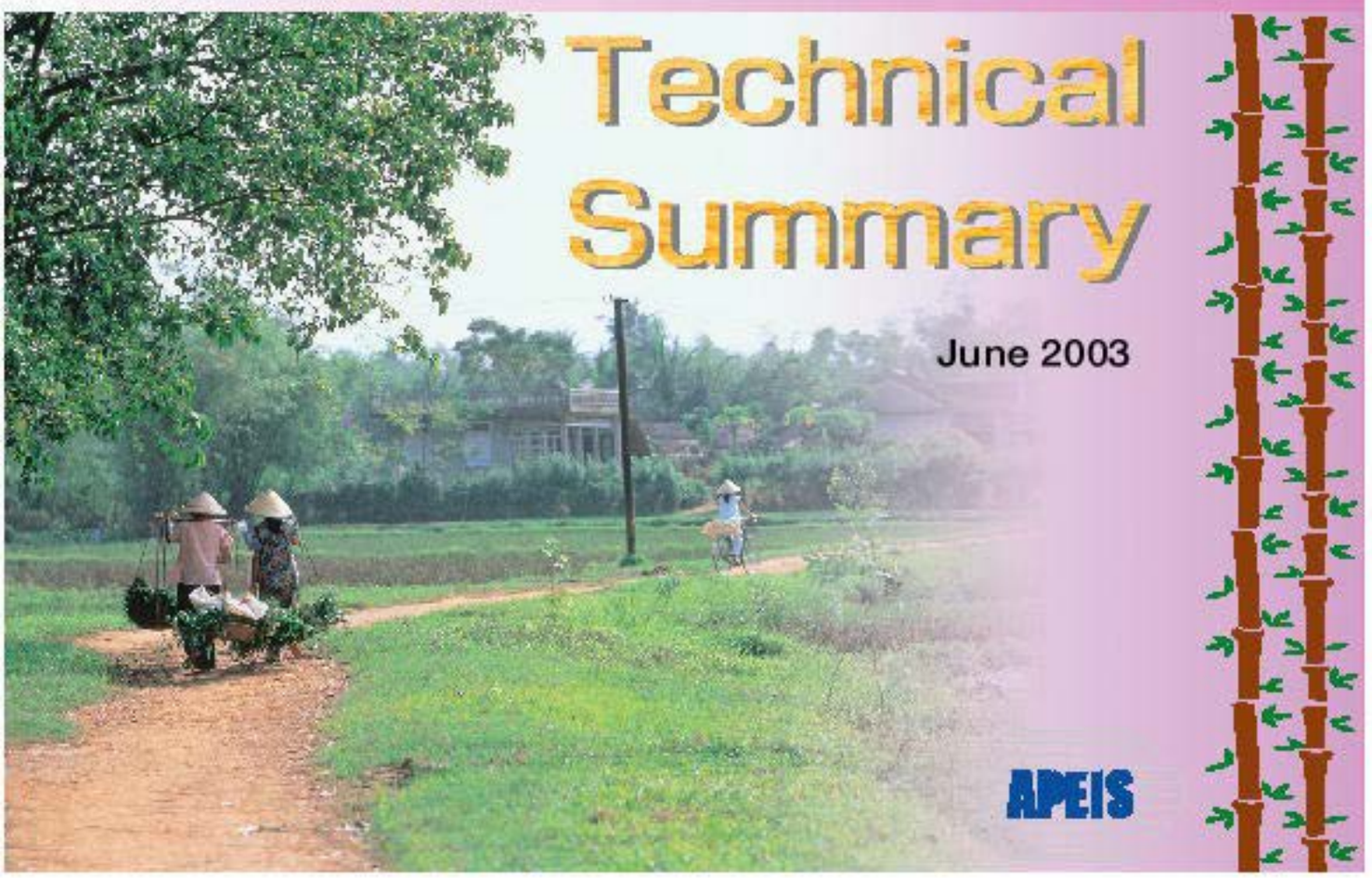
Asia-Pacific Environmental Innovation Strategy Project

APEIS



Research on Innovative and Strategic Policy Options (RISPO)



Technical Summary

June 2003

APEIS

1. What is APEIS-RISPO?

Research on Innovative and Strategic Policy Options (RISPO) is one of the three sub-projects of the Asia-Pacific Environmental Innovation Strategy Project (APEIS), an Asia-Pacific region-wide research project initiated as a Type 2 partnership/initiative of World Summit on Sustainable Development (WSSD)[1] in 2002[2]. RISPO, together with other sub-projects of APEIS, aims to contribute to the policy dialogue on sustainable development in the region by providing scientific knowledge-based tools for sustainable development.

1.1. Objectives and Scope

RISPO is a region-wide research project to be conducted in collaboration with various research institutes and key international organizations working in the fields of environment and development in the Asia-Pacific region. RISPO aims to jointly develop two knowledge-based reference tools, namely *Good Practices Inventory* and *Strategic Policy Options*, which can help policy-makers who seek better solutions for the sustainable development challenges they face. These two items will become available as common regional assets by March 2005. RISPO considers policy-makers to be the primary audience/users of these tools, but intends to invite wider audiences to further promote international discourse among a wide variety of stakeholders and enhance informed decision-making to lead our society toward sustainable development.

RISPO has the following four research themes:

- Promoting Eco-Markets and Eco-Industry
- Developing Innovative Urban Systems
- Appropriately Using Community Resources
- Networking Stakeholders for Action.

These themes are identified as key research areas for RISPO, considering their great potential to ignite and accelerate the process of environmental innovation in the Asia-Pacific region. Under these four themes, there are eight sub-themes with further specific focal points. International research teams are organized to collect good practice examples and explore policy options for each sub-theme.

One of the unique characteristics of RISPO is its approach. Environmental innovation is the overarching theme for three sub-projects of APEIS, and the sub-projects address sustainable development issues of urgent priority in the Asia-Pacific region, taking different approaches that complement each other. Although the Integrated Environmental Monitoring sub-project (IEM) and the Integrated Environmental Assessment sub-project (IEA) take bird's-eye-view approaches, adopting research methodologies such as satellite monitoring and computer modeling, RISPO emphasizes the importance of ground-based field-studies. By these practices, RISPO intends to develop a sound understanding of the factors promoting or hindering sustainable development in various settings and share the lessons learned among policy-makers and wider audiences.

1.2. Expected Outcomes

Good Practices Inventory[3] and *Strategic Policy Options* are two major expected outcomes of RISPO. Draft outcomes are planned to be available to the public by March 2004 (Preliminary Proposal). Refined versions will be ready by the end of the RISPO research phase, i.e. March 2005.

Good Practices Inventory (GPI)

Good Practices Inventory is an easily searchable database on the RISPO website, consisting of a number of good practice examples that are rich in lessons and potential for replication or application. Good (or unsuccessful) practices identified and analyzed by each research team are compiled into *Good Practices Inventory*. Information on each good practice includes the critical and innovative instruments that make the practice successful, lessons learned, and potential for application.

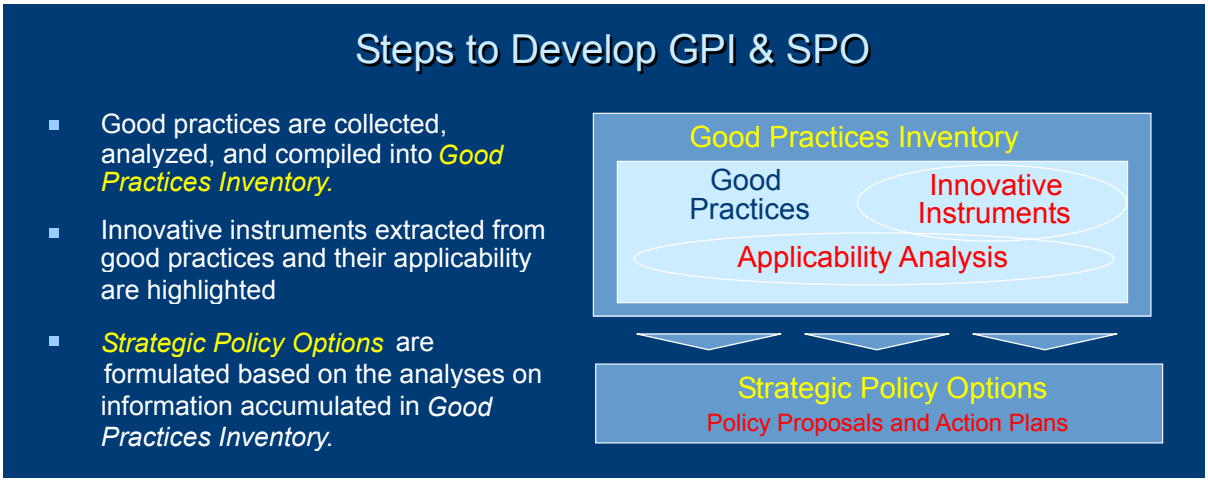
The general criteria for selecting good practices include such rules as:

- leads to an actual change that contributes positively to improvement in the specific area considered, or breaking new ground in unconventional approaches to the issue
- involves indicators of some visible or measurable change in the area of concern, with improvement in the environmental situation and at least no

[1] APEIS was proposed by the Ministry of the Environment of Japan in collaboration with a number of governments, research institutes, and key international organizations in the Asia-Pacific region.

[2] Duration of RISPO is April 2002 – March 2005.

[3] A prototype *Good Practices Inventory*, containing about 50 good practice examples with potential for replication/ application, is now available.



deterioration in the socio-economic situation, or vice versa
- demonstrates an innovative (uniqueness of either the product or process) and replicable approach.

Strategic Policy Options (SPO)

*Strategic Policy Option*s is a set of proposals – clues for maturing sustainable development policy – primarily targeting policy-makers at local, national, and/or regional or international levels. Proposals will be developed for each sub-theme of the RISPO research areas. Through a close look at the critical and innovative instruments extracted from good practices, the political implications of further promoting actions toward sustainable development will be examined. Taking the diverse social, cultural and economic backgrounds in the Asia-Pacific region into account, the policy measures necessary to put each strategy into practice will be described.

Strategic Policy Options may include proposals on strategic approaches to the issues of concern, policy options, and action plans focusing on the following components:

- technology measures (development, transfer, diffusion)
- financial measures
- governance (regulatory measures, institutional arrangements, capacity building)
- awareness raising and partnership

Capacity Building and Pilot Projects

It is important to put significant efforts into making active use of RISPO research outcomes instead of just leaving them as the simple database and proposals. RISPO recognizes the importance of providing policy-makers with the necessary capacity-building opportunities, as well as examining the feasibility of its proposals through pilot projects.

Although most of the capacity-building activities will be activated after March 2004 along with the preliminary proposals of *Good Practices Inventory* and *Strategic Policy Options,* some of the RISPO research sub-themes involve pilot project development in research activities.

Themes and Sub-themes of APEIS/RISPO

Themes	Sub-themes
Promoting Eco-Markets and Eco-Industry	Innovative financing for renewable energy development
	Creation of inter-boundary market for recyclable materials
	Improving environmental performance of small and medium-sized enterprises (SMEs)
Developing Innovative Urban Systems	Development of environmentally sustainable transport systems in urban areas
Appropriately Using Community Resources	Promotion of biomass energy
	Facilitating community-based tourism in protected areas
Networking Stakeholders for Action	Promoting environmental education by NGOs
	Promoting local/indigenous knowledge-based sustainable resource management

2. What are the Expected Products, Scientific Contributions and Current Progress?

2.1. Themes and Sub-themes of RISPO

RISPO aims to develop policy proposals to be used as the reference for policy-makers in the Asia-Pacific region who face challenges to lead our region, nations, and local areas toward sustainable development. The region contains diversity in geography, eco-systems and stage of socio-economic development, as well as in culture, values and beliefs. Therefore, the demands of the people who live in the region are diverse. Taking such diversity into consideration, RISPO selected the following four research themes that were common to the needs of many countries in the region. They are considered to constitute the essential approach to the promotion of environmental innovation in the Asia-Pacific region. The sub-themes in each of them address further specific issues of urgent and common concern.

Promoting Eco-Markets and Eco-Industry

The future of the environment in the Asia-Pacific region will be determined in significant part by the pace and quality of industrialization. The average annual growth of industry for East Asia and the Pacific between 1990 and 1999 reached 9.8 percent, far exceeding that of other regions. Asia's industrialization is highly energy intensive and involves high costs to the environment. As part of this growth, industrial wastes are growing in quantity and becoming more difficult to dispose of or degrade. Moreover, small- and medium sized enterprises (SMEs) play a critical role in the process of industrialization, and are responsible for most industrial pollution in certain countries. Many of the challenges facing the region will therefore depend on how the growth of markets and industry can be shaped in an environmentally sustainable fashion.

RISPO identified three sub-themes in this research area. The sub-theme *Innovative Financing for Renewable Energy Development* explores new financing mechanisms that hasten the development of the renewable energy industry and markets for renewable energy products/technologies in order to meet the growing energy demand through clean sources of energy. The second sub-theme is *Creation of Inter-boundary Market for Recyclable Materials*. Because of limited demand for recyclable materials on domestic markets, recyclable materials sometimes end up in landfills. On the other hand, because of limited supply of recyclable materials on domestic markets, firms sometimes end up using costly virgin materials. Creating an effective inter-boundary market can be a breakthrough for this situation so that it reduces waste and also production costs. The third sub-theme is *Improving Environmental Performance of Small and Medium-sized Enterprises*. In consideration of the critical roles that SMEs play in socio-economy, it is imperative to make policies that guide society in a sustainable manner and give SMEs the appropriate means of implementing environmental practices.

Developing Innovative Urban Systems

Urbanization is one of the most significant issues facing the Asia-Pacific region. In 2000, one in three people in this region lived in an urban area, compared with one in five in 1960. Urbanization in the Asia-Pacific region is predicted to continue to grow at an average rate of 2.4 percent per year between 2001 and 2015. This trend of rapid urbanization is posing burdens on the environmental capacity of urban areas. Major issues that cities in the Asia-Pacific region are facing are air pollution from industrial activities and transportation, waste management, and water and sanitation. The common denominator of these urban environmental issues is that they will not be solved by piecemeal approaches. Therefore, RISPO aims to develop innovative policy options to improve urban environment from a holistic viewpoint.

RISPO focuses on transport, one of the major sources of air pollution, as a sub-theme in this research area[4]. Air pollution from the transport sector is expected to rise owing to an increase in traffic demand and motorization in the

[4] Good practices related to urban issues, such as *Improving Urban Environmental Services through Private Sector Participation* and *Community Related Initiatives for Urban Environmental Management*, are also collected in collaboration with the Kitakyushu Initiative for a Clean Environment. These cases will be incorporated in *Good Practices Inventory*.

Asia-Pacific region. This sub-theme examines the innovative paths the cities in this region can take in order to develop *Environmentally Sustainable Transport Systems,* which can break the current trend.

Appropriately Using Community Resources

The unsustainable consumption patterns prevalent in Asia and the Pacific region remain a formidable obstacle to sustainable development. Rural communities are particularly vulnerable to environmental degradation resulting from unsustainable consumption patterns. Rural communities often lack access to the resources that can promote environmentally sound activities and lifestyles. Moreover, rural areas can be rich in natural resources and are often targets of overexploitation and environmentally destructive development strategies. Therefore, rural villages often face a breakdown in the traditional subsistence economy because of limited access to land and natural resources, lack of human and financial resources, and sources of employment.

Against this background, the objectives of the research conducted in this strategic research area are to formulate ideas to better utilize natural and community resources in order to realize sustainable development in Asia and the Pacific region, focusing in particular on rural communities. *Promotion of biomass energy* will draw out ideal energy mix options for countries in Asia and the Pacific by actively making use of biomass-derived residual wastes currently not in use, in order to sustainably use natural resources. *Facilitating Community-based Tourism in Protected Areas* will propose innovative ways to involve communities living in and around protected areas in tourism, in order to effectively use natural and community resources for integrated protected area management.

Networking Stakeholders for Action

Many Asian countries are now in the process of democratization and decentralization, which have brought about the need to reconsider the style of environmental governance. The multi-stakeholder approach has become increasingly important, as the state can no longer exert the strong leadership it used to in many cases. In other words, increased participation of non-state actors such as local authorities, businesses, NGOs, and local people is necessary to enhance environmental governance in terms of legitimacy and resources. However, it has been observed and reported that there are various obstacles to forging such partnerships between actors.

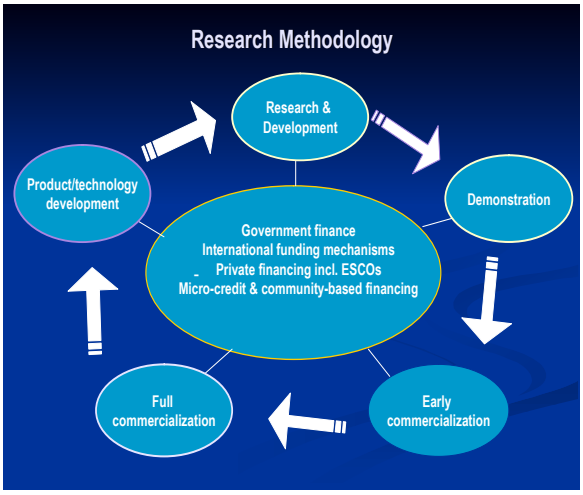
RISPO studies the networks among stakeholders as a way to overcome such obstacles and promote a multi-stakeholder approach. Two sub-themes have been identified, and both of them make the most of non-state resources by networking stakeholders, resulting in the enhancement of environmental governance. One is *Promoting Environmental Education by NGOs*, which focuses on the roles of NGOs in raising public environmental awareness. The other is *Promoting Local/indigenous Knowledge-based Sustainable Resource Management*, which focuses on the significant roles of local people who provide in-situ knowledge of sustainable resource management.

2.2. Details of Sub-Themes

2.2.1 Innovative Financing for Renewable Energy Development

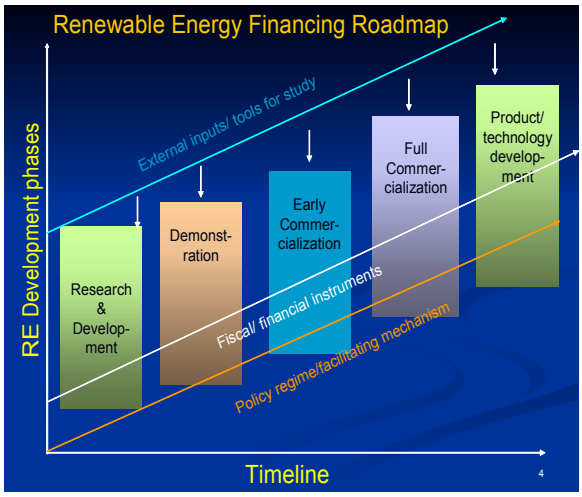
Outline

This research explores four areas that are likely to be the primary sources of finance for the development and commercialisation of wind and solar technologies and products in the mid to long term: government finance; international funding mechanisms (including the Clean Development Mechanism); private sector finance (including financing through energy service companies); and micro-credit and community-based financing.



The aim is to identify in these four areas innovative financing mechanisms that: 1) break down the high initial costs of renewable energy products and technologies; 2) increase competitiveness against traditional fossil fuels; 3) reduce the transaction costs of renewable energy products and technologies; and 4) ensure sustainability without public aid and subsidy.

The research is developing strategic policy options aimed at an innovative financing mix through a life-cycle approach, which include financing mechanisms for the stages of research and development; demonstration; early commercialization; full commercialization; and product and technology development. These policy options would provide an indication of how financing for the supply side (R&D, manufacturing) and demand side (consumer financing) could be optimized through an innovative mix of the four categories of financing considered.



Examples of Good Practice

- Public sector financing (Indian Renewable Energy Development Agency Ltd.: IREDA) for wind power development – Tamil Nadu, India
- Solar photovoltaic minigrids – a combination of government and community financing – Sunderbans, West Bengal, India
- Developing a market-oriented institutional and financial model for decentralized solar systems – Rajasthan, Uttaranchal, India
- Wind-power development by the private sector – a combination of the Clean Development Mechnism CDM and public sector financing (IREDA) – Karnataka, India
- Promoting household PV system application in remote areas through international funding – Inner Mongolia, Qinghai, Gansu, Xinjiang, Tibet, and western Sichuan, China
- Scaling-up of renewable village power through governmental finance and bidding based on market regulation – Inner Mongolia, Qinghai, Gansu, Xinjiang, Tibet, Shanxi and Sichuan, China
- Economic incentive policy–stimulated growth of the market for a small wind turbine – Inner Mongolia, China
- Renewable energy finance: the experience of the first CDM project in China.

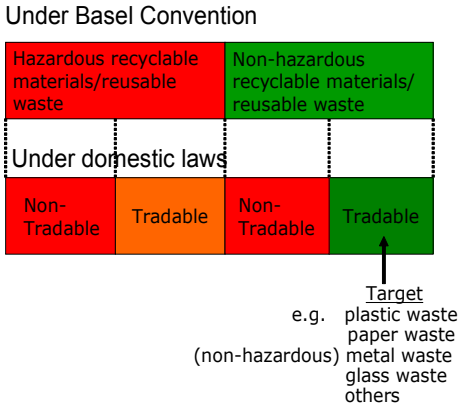
2.2.2 Creation of Inter-boundary Market for Recyclable Materials

Outline

The UN Economic and Social Commission for Asia and the Pacific (ESCAP) reported in its *State of the Environment in Asia and the Pacific 2000* that the amount of industrial solid waste generated in the Asia-Pacific region is expected to increase substantially and will double in less than 20 years at the current rate of growth of industrial solid waste generation. Promotion of recycling is one solution to reduce industrial waste. In addition, for the countries with relatively cheap labor costs of waste separation and limited access to expensive virgin materials, the use of recyclable materials is sometimes more attractive in terms of production cost than is the use of virgin materials. Promotion of the recycling of industrial waste could reduce the production cost as well as the volume of industrial waste.

This research aims to propose strategic policy options to create an effective inter-boundary market of recyclable materials and promote their use in order to achieve a win-win situation.

Recyclable materials targeted in this research can be seen in the following diagram.



The research activities have three components. First, to determine the current and potential supply and demand of recyclable materials in the region, the following survey is being conducted in countries of Thailand, the Philippines, the Republic of Korea and Japan:

<Supply side>

- What quantity of tradable non-hazardous recyclable materials is produced domestically?
- How many of these materials are domestically recycled and disposed of, and how many are exported overseas?
- Where are they exported to?

<Demand side>

- What types of tradable non-hazardous recyclable materials are in demand domestically?
- What types are domestically obtained and what types are imported from overseas?
- Where are they imported from?

Secondly, to determine the factors that are important for creating an effective inter-boundary market of recyclable materials, information on good practice in inter-boundary trading of recyclable materials and in domestic material exchange systems is being collected from Thailand, the Philippines, the Republic of Korea and Japan.

Lastly, strategic policy options to create an effective inter-boundary market of recyclable materials and promote their use will be developed from analyses of the above-mentioned survey and good practices.

HMR Envirocycle (Manila, Philippines)

Examples of Good Practice

One example of good practice is the waste recycling business of Wongpanit Co. Ltd. in Thailand, which purchases and sells waste domestically and to and from abroad. Its main trading partners are those in the Lao PDR, Cambodia, Vietnam, Myanmar, the People's Republic of China, Taiwan, the Philippines and Malaysia.

Pilot Project

To evaluate the strategic policy options, a pilot project that will experiment in the inter-boundary trade of recyclable materials among four countries (Thailand, the Philippines, the Republic of Korea and Japan) is planned.

2.2.3 Improving Environmental Performance of Small and Medium-sized Enterprises

Outline

It is widely recognized that SMEs are important vehicles in the economy and are substantial suppliers of employment opportunities in Asia and the Pacific. At the same time, the environmental impacts that SMEs cause have reached a level that can no longer be ignored.

Under such circumstance, globalization of the economy and pressure from the international community have virtually forced SMEs to widen their narrow focus of profit-seeking to one of sustainable economic operations. However, technical and financial constraints as well as insufficient information hamper them from doing so.

Conventional coal-based furnace (Firozabad, India)

The research work of this theme sets its objective as: To examine and identify practical means of improving the environmental performance of SMEs.

To conduct a thorough analysis and develop strategic policy options (SPOs), the research work has started by delineating the overall role of SMEs in the socio-economy in relation to the environment. Background information has been collected on productivity figures, existing government policies, and programs supported by non-public sectors through literature reviews and sometimes face-to-face interviews. Further, some good practices under the theme have been examined to derive the critical essence of possible SPOs. (See below.)

Some ideas for SPOs include gearing up the operations of industry associations for the environment; setting up ISO-type environmental management systems applicable to SMEs at a cluster level; and engaging SMEs in environmental improvements by a business-oriented approach. Further research will be focused on exploring how the identified SPOs will be practically implemented – in other words, what should be done to make the SPOs actually happen.

Examples of Good Practice

In the course of the research work, the following examples of good practice have been determined to improve the environmental performance of SMEs:

- Implementation of an environmental management system in a medium-scale manufacturing industry (Thailand)
- Energy conservation in a medium-scale autopart manufacturer (Thailand)
- Demonstration and dissemination of cleaner technologies in a small-scale glass industry (India – see photos)
- Adaptation of vertical shaft brick kiln (VSBK) technology for the brick industry (India).

Natural-gas-fired furnace (Firozabad, India)

Capacity-building

The Preliminary field studies and interviews have shown that some sort of capacity-building to increase the understanding of sustainability must be carried out at all levels (local government, business owners, and employees). The target groups and methods have to be carefully identified in accordance with the objective of the capacity-building. It would be appropriate to invite local NGOs to help design capacity-building programs, so that their cooperation will be ensured on a long-term basis. Moreover, funding aspects should be incorporated into the planning.

2.2.4 Development of Environmentally Sustainable Transport Systems in Urban Areas

Outline

This research aims to develop systems for environmentally sustainable transport (EST) for the cities in the Asia-Pacific region as strategic policy options.

Strategic policy options for EST will be developed on the basis of scenario analysis, which offers a means of exploring a variety of long-range alternatives.

The procedure for this research is as follows:

Categorization of future city types
'Good cities' of the future are categorized according to the degree of demand for transportation and the types of measures needed to accommodate transportation needs. These city types are: (i) High-Tech Dependent/ Growing City; (ii) Automobile Dependent/ Growing city; (iii) Community Independent/ Sustainable City; (iv) Public Transport Dependent/ Sustainable City; and (v) Public Transport Dependent/ Growing City.

Collection of good practices
Good practices are being collected and compiled in *Good Practices Inventory.*

Development of scenarios
Field-based studies will be carried out for selected cities (Beijing and Taiyuan in China, and Bangkok in Thailand), and qualitative city-specific scenarios will be developed on the assumption that the city will develop into one of the categories of a 'good city'.

Development of draft Strategic Policy Options
On the basis of the scenario analysis and the application of good practices from the inventory to the city, draft Strategic Policy Options will be developed.

Calculation of an index for measuring innovation
The effect of draft *Strategic Policy Options* will be estimated by quantitative model simulations in collaboration with the IEA.

Examples of Good Practice

Examples of good practice have been collected in Beijing, Shanghai (China), Kathmandu (Nepal), Singapore (Singapore), Curitiba (Brazil). Bangkok (Thailand), Seoul (Korea), Bogota (Colombia), and Quito (Ecuador). It is planned to collect examples from Cairo (Egypt), Sapporo and Fukuoka (Japan) , and other South East Asian countries.

Good Practice Examples Collected in Year 1

City	Title	Examples of Critical Instruments
Beijing	Emission Control	High-quality fuel standard, emission checking system
	Public Transport System	International bidding, public participation in price-setting
	Alternative Fuel Vehicles	Establishment of compressed natural gas (CNG) and liquefied petroleum gas (LPG) stations
	Integrated Road Transport System	Financial innovation
Shanghai	Emission Control	Vehicle license auction, elimination of motorbike
	Rail-based mass rapid transit system	Financial innovation, competitive operation
	Alternative Fuel Vehicles	Investment and loans, establishment of supervision system
Kathmandu	Electric Three-wheelers	Role of NGOs and civic society, favorable electricity tariff
Singapore	Environmentally Sound Transportation Planning	Fiscal measure to restrain car ownership, public transport , electric road pricing, vehicle quota system
Curitiba	Integration of Land Use and Bus System	Single fare for public transport, tube-shaped bus stations, all-bus network transit system

Compressed natural gas bus (Beijing)

Pilot Project

One proposal for a pilot project could be the introduction of clean fuel buses in a small to medium-sized city in China.

2.2.5 Promotion of Biomass Energy

Outline

The objective of this research is to determine the preferred mix of energy supply in the Asia-Pacific countries, mainly by focusing on a Biomass Energy Promotion Strategy (BiEPS) as part of *Strategic Policy Options*.

Strategic policy options for BiEPS are being developed through the following process:

Investigation of available biomass energy resources
In the first year, the use of biomass energy in India, Thailand and Japan was reviewed. This is needed as a basis on which to review the literature on other Asia-Pacific countries.

Categorization of targeting of biomass energy resources
There are many kinds of biomass energy resources. Bagasse, rice husk, animal waste, wood and solid waste (e.g. palm oil shell, municipal waste, wood residues) were selected as the target biomass energy resources for consideration in the review of the Asia-Pacific countries.

Collection of good practice examples and development of technology list for comparison studies
Good practices are being collected by focusing on the above and targeting biomass energy resources. They will be added to *Good Practices Inventory*. Each team will compile a summary list of biomass energy conversion technologies. These lists will become important inputs into comparison studies of each target biomass energy resource.

Development of story lines to promote biomass energy use
On the basis of comparative studies, story lines to promote biomass energy use will be developed. They will take into account economic instruments, technology components, organizational arrangement, and policy and regulatory instruments. Quantitative impacts will be simulated in collaboration with the IEA sub-project.

Proposal of Strategic Policy Options
Draft *Strategic Policy Options* at a local, country, and regional level will be proposed on the basis of this process. These proposals will be improved by effective interaction between the research team and stakeholders.

Examples of Good Practice

In the first year, the following examples of good practice were identified and compiled in *Good Practices Inventory*.

India
- Satisfying heating needs in rural cottage industries through a cluster- and application-based approach to biomass gasification
- Use of rice husks as fuel in process steam boilers
- Biogas plants based on night soil

Thailand
- Biogas technology for pig farm wastes
- Biogas technology for carbohydrate-based wastewater from a starch factory
- Fluidized bed combustion of biomass

Circulation tank and biogas domes at pig farm
(Pak Tho District, Thailand)

2.2.6 Facilitating Community-based Tourism in Protected Areas

Outline

The objectives of this strategic research are a) to compile good practices of community-based tourism (CBT) in the protected areas of four countries in Asia (India, Indonesia, Japan and Thailand) into *Good Practices Inventory*; and b) to propose innovative strategic policy options on ways to actively involve those communities living in and around protected areas in tourism and thus facilitate effective integrated protected area management.

For the purposes of this research, 'community-based tourism' has been defined by its objectives, namely: gain local economic development; obtain a certain level of participation; provide a socially and environmentally responsible experience for visitors; and have a positive impact on the conservation of natural and/or cultural resources.

Examples of Good Practice

To select examples of good practice, the CBT team developed the following criteria:

Participation/ relationship	Have participation by local communities
	Have co-operation between protected area tourism authorities and communities working in community-based tourism
	Support a feeling of local community ownership of community-based tourism ideas, concepts and actions
Nature/ environmental conservation	Increase conservation of key resources in and around protected areas
	Build upon environmental awareness and others by local communities
	Lead to increased environmental awareness and improved attitudes by local communities and visitors
Socio-economic issues	Retain significant economic benefits in local communities
	Contribute to local social and community development in and around protected areas
Business	Be a profitable business for local communities
	Promote authentic products that build upon local natural and cultural assets

Other indicators of sustainability are to be developed when necessary by using participatory methods.

Local guide performing his duty
(Doi Inthanon National Park, Thailand)

Good practice sites identified in FY 2002 were as follows:

India
- Multi-stakeholder tourism planning for the Corbett National Park Landscape

Indonesia
- Community-based tourism in Gunung Rinjani National Park
- Community-based tourism in Gunung Halimun National Park
- Community-based tourism in Gunung Gede Pangrango National Park
- Community-based tourism in Gunung Bromo-Tengger-Semeru National Park

Japan
- Nature tourism promoted by the Whale-watching Association, Ogasawara National Park

Thailand
- Community-based Tourism in Doi Inthanon National Park: case study of Ban Mae Klang Luang Tourism Alliance, Chiangmai
- Ecotourism of Ban Khao Lek at Chalerm Rattanakosin National Park
- Nature and Environmental Conservation Group of Ban Wang Lung at Khao Luang National Park

Awareness and capacity building, partnership, and self-regulatory instruments were important components in most of the good practices identified.

Capacity Building

Building the capacities of policy makers is a vital component of the facilitation of CBT in protected areas. The development of programs targeting policy-makers will fill a gap in the capacity-building programs that are currently available.

2.2.7 Promoting Environmental Education by NGOs

Outline

Environmental education (EE) by NGOs has been taken up as a sub-theme of RISPO for the following reasons. First, capacity-building is a key factor in helping countries to cope with the socio-political transitions (see *Networking Stakeholders for Action* in 2.1.). Secondly, as is seen from the UN's plan to launch the 'Decade of Education for Sustainability', there is an increased need for policy research to promote EE worldwide. Thirdly, the role of NGOs in promoting EE has become increasingly important in Asia owing to the growth of NGOs and the insufficient availability of resources within the formal education sector. Lastly, EE is one of the areas that can be effectively promoted by stakeholder networks. Therefore, this research tries to provide 'policy options' to promote EE by NGOs through *networking stakeholders*, as well as 'good practices' to be shared among related parties to improve their programs. This research is focused on Indonesian cases for the moment, because of limited time and resources, the abundance of good practices in Indonesia, and their applicability to other countries. Together with RMI-the Indonesian Institute for Forest and Environment (the partner institute in Indonesia) and other local experts, Institute for Global Environmental Strategies (IGES) has been conducting research activities such as literature reviews, interviews, observations, focus-groups and questionnaire surveys on this sub-theme.

From our analysis of good practice examples, four SPOs will be formulated on four key issues. 'Networking' is the key instrument in each SPO. These four issues are networking NGOs; networking NGOs with the local community; networking NGOs with primary and secondary education; and networking NGOs with higher education.

Examples of Good Practice

A few good practices have already been identified. One of them is the 'NGO Environmental Education Network in Indonesia (*Jaringan Pendidikan Lingkungan*: JPL)'. It has resulted in *improved external relations* (e.g. an increase in resources such as funding and training opportunities) and *improved internal relations* (e.g. facilitation of communication and resource-sharing, leading to an increase in the efficiency and effectiveness of member's EE activities). These benefits have attracted NGOs, and JPL's membership has increased from 27 in 1996 to 85 in 1999. Critical instruments in this successful case are *Awareness/capacity building*, *Partnerships*, and *Institutional Arrangements.*

Another example is '*REPLING* – an Environmental Education Route Program', which is a collaborative program conducted at Bogor Botanical Garden in Indonesia by an NGO and primary and secondary schools. It emphasises guiding interpretation as an education method, which is used in combination with other methods such as nature game activities, observation, and group discussion. The participants follow the REPLING trails in the Botanical Garden in groups (each group consists of 6 to 10 people) aided by facilitators. The program has brought about positive impacts on schools, participants, their parents, and facilitators. The case has shown that guiding interpretation is an effective method of EE, and that places such as botanical gardens can be a powerful EE tool that supports and complements the primary and secondary education sector. Critical instruments in this successful case are *Awareness/capacity building* and *Partnerships.*

Around 20 good practices will be collected within the next 2 years. See the *Technical Report* or *Good Practices Inventory* for further information.

JPL Annual Meeting in 1999
(Seloliman, Indonesia)

2.2.8 Promoting Local/indigenous Knowledge-based Sustainable Resource Management

Outline

The importance of local/indigenous knowledge (LINK) and its potential in the sustainable use of natural resources has been repeatedly emphasized in international discourses on sustainable development. In 1992, Agenda 21 of the Rio Declaration highlighted the importance of holistic traditional knowledge of lands, natural resources and the environment developed over many generations by local/indigenous people. The United Nations proclaimed 1993 as the 'International Year for the World's Indigenous People' and presented a unique opportunity to mobilize international cooperation to preserve and share local/indigenous knowledge for sustainable resource management. Recently, in 2002, the Johannesburg Plan of Implementation adopted at the World Summit on Sustainable Development again drew people's attention to the vulnerability of local, traditional, and/or indigenous knowledge.

It is worth noting that despite rising awareness of LINK, such knowledge and practices are rapidly vanishing in a number of Asian countries. LINK embedded in a given culture or society is likely to be lost irretrievably when the culture or society experiences drastic socio-economic changes. Once the unique and complex cultural norms that functioned as the basis for various local practices are lost, the knowledge can barely survive and cannot be passed on to future generations. The chances for learning lessons from such knowledge to realize sustainable development are gradually becoming slimmer.

This research aims to develop strategic policy options to promote LINK-based sustainable resource management, with two primary objectives:

i) preservation and promotion of LINK, and
ii) application and adaptation of LINK

The former aims to maintain the diversity of existing LINK-based sustainable resource management practices. The major focus here is to examine and propose a variety of approaches to encouraging local people to sustain such practices in the face of rapid socio-economic change. These approaches include awareness-raising, capacity-building, provision of economic incentives, the use of advocacy systems, and the provision of administrative support. The latter objective is to examine the applicability of LINK-based practices. Although many LINK-based practices are site- and culture-specific, some aspects of these practices can be transferred to other settings. Likewise, the lessons learned from LINK, such as the roles of local/indigenous people and culture, the use of low-cost technologies, and the implementation of the necessary institutional arrangements, may be shared among policy-makers who aim to develop better planning for sustainable resource management.

Examples of Good Practice

Currently, the RISPO-LINK research team is studying good practices in LINK-based sustainable resource management in the coastal and mountainous areas of Bangladesh, China, Thailand and Vietnam. For example, the gei wai at Mai Po and the Inner Deep Bay Ramsar Site, Hong Kong, China, is a traditional practice of shrimp cultivation in a sustainable manner. The gei wai (literally meaning a pond enclosed by a bund) is built in the coastal wetland, and its operation is carefully designed to minimize adverse impacts on the environment. Young shrimp flushed into the gei wai by tidal waves in autumn are fed only naturally, e.g. on the leaves of mangroves planted in the gei wai. The gei wai landscape provides precious habitats for water birds and other wildlife at the same time.

Gei wai ponds, Mai Po (Hong Kong, China)

Other LINK-based practices, such as indigenous strategies of coping with climatic extremes (floods and droughts) in Bangladesh, traditional systems of community-based water management in Thailand, and joint reforestation initiatives between local authorities and local people in Vietnam, are also being examined, with the close cooperation of researchers from both the social and natural sciences.

3. How can the APEIS-RISPO products be applied for policy formulation/implementation works?

RISPO products provide policy-makers with tested ideas and strategic policy options for achieving sustainable development. When developing policy to address an environmental problem, one of the good approaches is to consult past experience. *Good Practices Inventory* offers a list of lessons identified and categorized from various past practices in the Asia-Pacific region. *Strategic Policy Options*, which are a combination of good practices validated with pilot studies, offers practical solutions in selected area that can serve as models for actual policy development.

Good Practices Inventory is a compilation of good (or unsuccessful) practices, with analyses of those instruments considered critical for success. Users can search the database for cases that apply to them. Currently, a prototype is available on the Internet.

Strategic Policy Options are packages of policy proposals that will support policy-making toward sustainable development in the Asia-Pacific region. Stakeholders can identify and refer to the proposals applicable to policy areas of interest, taking into account their own environmental, socio-economic, and cultural backgrounds. Preliminary *Strategic Policy Options* will be developed by March 2004.

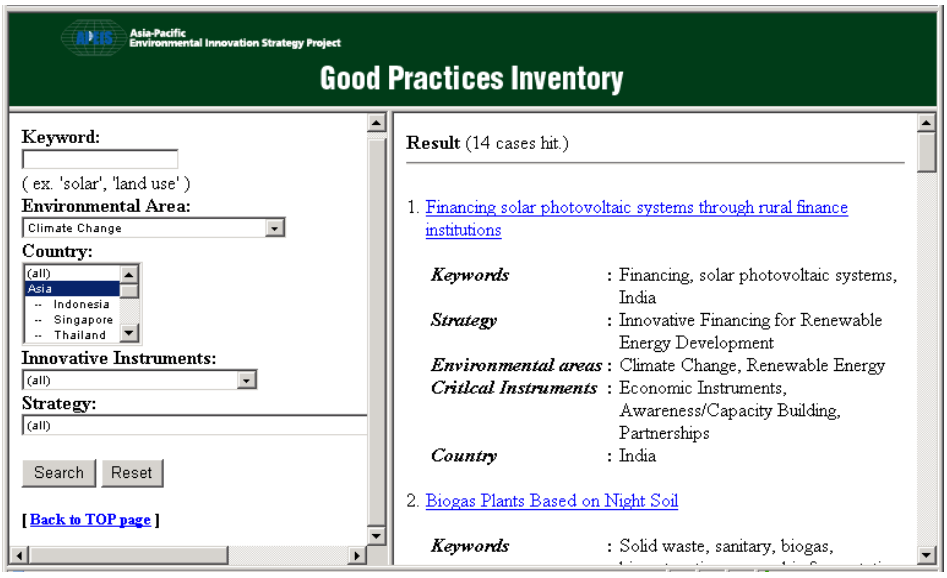
To demonstrate the feasibility and effectiveness of Strategic *Policy Options,* some of them will be implemented as pilot projects. The findings from these RISPO outcomes will be incorporated in capacity-building activities to enhance the knowledge and skill of policy-makers and/or the awareness and participation of other stakeholders.

Current Progress

Approximately 50 good practice examples are searchable in the prototype of *Good Practices Inventory* on the website (http://iges.or.jp/APEIS/RISPO). They include examples of renewable energy, recycling, cleaner production, resource management, and environmental education.

Cases can be searched not only by environmental area, but also by keyword, country, innovative instruments and/or strategy.

A detailed description of each case can be retrieved by clicking on the title. Each case provides information on the following items: (1) summary of the practice; (2) analysis of what was innovative in the use of critical instruments and why and how the instruments have contributed to success; (3) qualitative and/or quantitative impacts on the environment and the socio-economy; (4) lessons learned from the practice; (5) potential for application of the practice, and other relevant information. The box on the next page shows examples of cases with high potential for application.



Search interface of Good Practices Inventory

Examples of cases in *Good Practices Inventory*

Example 1: Developing a Market-Oriented Institutional and Financial Model for Decentralized Solar Systems, India

Summary of the Practice The Uttam Urja initiative addresses the limitations of subsidy-driven programs for decentralised solar systems, particularly with respect to technology customisation and delivery mechanisms. The project is developing a grassroots Energy Service Network (ESN) comprising the local NGO, dealers and retailers of electronic systems, financial intermediaries, and manufacturers of solar home systems (SHS). It represents the provision of a 'package' of energy products and services for rural people, rather than the provision of just the product, as used to be done in various initiatives undertaken by the government.

Critical Instruments The Uttam Urja model combines a unique institutional model, technology and awareness, and capacity-building to showcase the commercial viability of SHS markets.

Impacts Between 1999 and March 2003, close to 1000 domestic lighting systems comprising lanterns, home lighting systems and solar panels were sold without the need for government subsidy.

Lessons Learned Setting up local assembly facilities and entrepreneurship-based product dissemination can reduce the system and service costs. Customers are willing to purchase at real market price (without subsidy) if products and services are of high quality. Instead of upfront subsidy to customers, the effort should be on facilitating entrepreneurial ventures and the provision of soft credit to customers.

Potential for Application The ESN institution provides a model that builds on previous experiences and can be easily replicated.

Example 2: Ban Wang Lung Nature and Environmental Conservation Group at Khao Luang National Park, Thailand

Summary of the Practice The main activities of the Nature and Environmental Conservation Group, formed in 1988, are forest plantation, forest fire control, forest patrol and surveillance. In 1999, villagers started a community-based tourism operation, which brings additional income and supports forest conservation.

Critical Instruments The most critical instrument that makes this community-based tourism successful is the awareness of local people of forest conservation. Another is the partnerships with several institutions.

Impacts Involvement of locals in forest conservation; earning of supplementary income; creation of social bonding; increasing partnerships with protected area authorities.

Lessons Leaned Importance of flexibility on the part of the park authorities in exercising their authority and regulations; understanding of park organization objectives by both the park officials and local people leads to cooperation in tourism management by the community; the need for locals to acquire hospitality skills.

Potential for Application To examine the applicability of this practice, studies have been conducted by the Ministry of Interior and the Thailand Research Fund. Nature study groups in schools have also stayed at Khao Luang to learn from the experience of the Conservation Group.

Participating Organizations

(as of April 2003)

Institute for Global Environmental Strategies (IGES), Japan
Bangladesh Resource Centre for Indigenous Knowledge (BARCIK), Bangladesh
Energy Research Institute (ERI), China
The University of Hong Kong, China
Department of Forests, Government of Uttranchal, India
The Energy and Resources Institute (TERI), India
Indonesian Ecotourism Network, Indonesia
RMI – The Indonesian Institute for Forest and Environment, Indonesia
University of Gadjah Mada, Indonesia
University of Indonesia, Indonesia
National Institute for Environmental Studies (NIES), Japan
Sustainable Society Promotion Center, Japan
Management Association of the Philippines, Philippines
Korea Environment Institute (KEI), Republic of Korea
Asia Institute of Technology, Thailand
Kasetsart University, Thailand
Mahidol University, Thailand
National Center for Genetic Engineering and Biotechnology (Biotec), Thailand
Thailand Environment Institute (TEI), Thailand
Vietnam National University, Vietnam
United Nations Environment Program (UNEP) Collaborating Centre on Energy and Environment (UCCEE)

Websites

Research on Innovative and Strategic Policy Options (RISPO)
http://www.iges.or.jp/APEIS/RISPO/

Asia-Pacific Environmental Strategy Project (APEIS)
http://www.ecoasia.org/APEIS/

Integrated Environmental Monitoring (IEM)
http://www.nies.go.jp/basin/index-e.html

Integrated Environmental Assessment (IEA)
http://www.nies.go.jp/social/aim/apeis/

Web site

Research on Innovative and Strategic Policy Options（RISPO）　*http://www.iges.or.jp/APEIS/RISPO/*

This picture is painted by Yuri Nakajima

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