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革新的環境政策

Best Practice on Environmental Policy in Asia and the Pacific

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Editor's Note

Our academic journal, *International Review for Environmental Strategies (IRES),* was launched in 2000, two years after the establishment of the Institute for Global Environmental Strategies (IGES). Coming just before the tenth anniversary of IGES in April 2007, it is my greatest pleasure to be able to deliver the twelfth issue of *IRES*, featuring "Best Practice on Environmental Policy in Asia and the Pacific," consisting of eight papers that together formulate a report on the research project, "Research on Innovative and Strategic Policy Options" (RISPO I).

The first ten years of IGES have not always been easy. We have constantly been asking ourselves what strategic policy research means, and how IGES could contribute to the sustainable development of the Asia-Pacific region, reflecting the regional focus on global environmental issues.

Upholding the spirit of the IGES Charter, our researchers have been trying to integrate academic research results with practical policy suggestions, synthesizing several conventional research disciplines with each other. Maintaining interdisciplinary viewpoints has been crucial, given that almost every aspect of human activity nowadays can be seen in terms of the environment. The results of our efforts may not be immediately obvious, but we are sure that they will help us "make a change" for the betterment of the global environment and for the realization of sustainable societies in this region.

I would also like to acknowledge Dr. Amado Tolentino for the contribution of two essays to this issue of *IRES*: "The Challenges of Tsunami Disaster Response Planning and Management" and "Wetland Cultural Heritage in the Pacific". In these papers, Ambassador Tolentino calls for an interdisciplinary approach, from local communities to international responses, and substantiates his conclusions from his own broad experience.

Finally, I would also like to thank the readers of *IRES* who have supported us throughout the twelve issues. IGES, as always, welcomes comments and submissions of articles from the readers of *IRES*, in order for us to contribute further to sustainable development for future generations.

Akio Morishima
Chair of the Editorial Board,
International Review for Environmental Strategies
Chair of the Board of Directors and President,
Institute for Global Environmental Strategies

Introduction to Best Practice on Environmental Policy in Asia and the Pacific

Where do policies originate? What environmental policy trends and issues are receiving the greatest attention globally? What makes environmental policies successful or unsuccessful? Who should be involved in designing and implementing them? How do policies pass from one country to another? How should they be chosen, and what should be in them? These are some of the questions that the Institute for Global Environmental Strategies (IGES) seeks to answer.

This issue of the *International Review for Environmental Strategies (IRES)*, attempts to answer some of these questions.

Starting in 2001, IGES conducted a three-year research project entitled Research on Innovative and Strategic Policy Options I (RISPO I), under the Long-term Perspective and Policy Project (LTP). This project was supported by the Ministry of the Environment of Japan. RISPO I aimed at (i) developing knowledge-based reference tools such as a good practice inventory and (ii) proposing strategic policy options that would help policymakers seek better solutions for the challenges of sustainble development. The basic assumption was that if we collected so-called good practices observed in various parts of Asia, analysis of these would enable us to identify and develop strategic policy options for policymakers in various countries to consider. As an interim output, out of 100 good practice cases, we developed 50 strategic policy options. These were categorized into eight distinct groups: (i) innovative financing for renewable energy development, (ii) creation of inter-boundary markets for recyclable materials, (iii) improving the environmental performance of small and medium-sized enterprises, (iv) development of environmentally sustainable transport systems in urban areas, (v) promotion of biomass energy through innovative financing, (vi) protected area management using community-based tourism, (vii) promoting environmental education by non-governmental organizations (NGO), and (viii) promoting local/indigenous knowledge-based sustainable resource management.

IGES has developed several good practice databases apart from RISPO I, however—as was highlighted in a series of peer reviews during 2003—not enough analysis has been conducted on the collected data. After the RISPO I study, there was a strong belief in IGES that the more than 100 good practice case studies we had gathered and documented could be analyzed again to draw out success factors for effective promotion of a sustainability agenda. After numerous intensive discussions among LTP staff, we decided to use a common analytical method to draw out success factors in four integrated sectors: (i) policies for a post-fossil fuel era, (ii) policies for industrial efficiency and recycling, (iii) policies for environmentally sustainable transport, and (iv) policies for participatory management of natural resources.

The reason LTP undertook this additional analysis was mainly to respond to the constructive criticisms of IGES's peer reviewers. The degree of success remains a question, but at least a comprehensive analysis was conducted to draw lessons more systematically from the RISPO I good practices.

This new study combined a textual pattern-matching technique (looking for occurrences of selected key words or phrases in the text) with analytical assessment of the individual case studies. This methodology was used to seek answers to some key questions about environmental policymaking, particularly to see what actors, policymaking processes, and policy content—individually and in combination—were characteristic of successful environmental policies.

The following series of eight linked articles describe the research and its findings. In chapter 1, Peter King and myself trace the development of environmental policy, both internationally and in Asia and the Pacific.

Chapter 2 and 3, by the same authors, looks at the processes and underlying principles that determine how environmental policies are selected, adopted, and adapted by different countries, followed by a brief description of the research methodology used.

Chapter 4, by Akira Ogihara and three other researchers, seeks transition strategies from fossil fuel-based energy to a renewable enegy society. They found that appropriate market development and wider stakeholder involvement are effective among different policy options. They also conclude that a leapfrog approach for off-grid areas will enable developing countries to move directly to renewable energy and should be encouraged.

Chapter 5, by Taeko Takahashi and others, looks at resource efficiency and stresses that small and medium enterprises are the key, but often difficult to reach through national environmental policies. They further identify the means to achieve resource efficiency as good supply-chain linkages, industry clusters, producer associations, voluntary agreements through public-private partnerships, good technical support, and the underlying threat of increased regulation if voluntary approaches fail.

Chapter 6, by Naoko Matsumoto and others, examines transportation policy and its implementation in different cities. Contrary to common assumptions that environmentally sound policies are only developed in the North and then adopted by the South, they found some innovative transportation policies have evolved in cities of developing countries and were then emulated by other cities, both in the South and in the North.

Chapter 7, by Puja Sawhney and four colleagues, observes the growing participation of civil society in natural resource management and decision making. The paper stresses that natural resources, whether a forest or a coastal fishery, cannot be managed sustainably by government or civil society alone. It also highlights the important role played by the NGO sector creating environmental awareness which is also important for the management of natural resources. Increased participation proves to be more resource efficient and cause less conflict.

Chapter 8 sums up the entire study by drawing together the findings of the earlier chapters. Its broad message is that environmental policy is undergoing rapid change, and thus having appropriate, scientific and up-to-date findings and environmental policy option tools available is vital for policymakers in Asia and the Pacific. Looking into the policies that have been tried in the past—not just good practices like those presented in the RISPO I case studies, but also cases of failure—will help to point the way forward in environmental policy for sustainable development.

This report is a product of teamwork, and I would like to thank all of those involved in it for their commitment and hard work. First, special thanks go to Dr. Peter King, who joined the LTP team as a senior policy adviser. He facilitated discussions, had the analytical framework agreed, and helped to identify specific points discussed in each chapter of this RISPO I report. I would like to thank all the other staff involved for taking this additional challenge seriously and completing this report. Lastly I would like to thank the staff of the RISPO I partner institutes, who originally developed the good practice case studies together with IGES.

I sincerely hope that this first attempt can contribute to further discussions to promote the sustainable development agenda in Asia and the Pacific.

Hideyuki Mori
Special Editor,
International Review for Environmental Strategies
LTP Project Leader and Vice President,
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Best Practice on Environmental Policy in Asia and the Pacific: Chapter 1

The Development of Environmental Policy

Peter N. King[a] and Hideyuki Mori[b]

The environmental policies in place today across the globe have been arrived at through a process of evolution, adoption, and adaptation. This paper outlines how environmental policies have evolved over time, including how their scope has broadened from looking at primarily industrial pollution to addressing a host of other environmental problems, especially in natural resource management. It also examines how the measures that have been adopted by governments to tackle environmental problems have changed, from mainly command-and-control measures to a mix of policy instruments that include self-regulation and market interventions. The paper is the first of a series of eight papers presented in this special issue of the *International Review for Environmental Strategies (IRES)* which together comprise the report of a recent research project carried out by the Institute for Global Environmental Strategies (IGES) and several partner institutes to extract lessons for policymakers from the Good Practices database of IGES's Research on Innovative and Strategic Policy Options (RISPO). It provides a conceptual background for the report. The last section of the paper provides a brief introduction to the research and describes the structure of the rest of the report.

Keywords: environmental policy, RISPO, policy instruments

1. Introduction: Environmental policy

What do we mean by *environmental policy*? Many different definitions have been offered in the last few years. Some of these focus only on actions, and see government as the only actor capable of making policy, for example "any actions deliberately taken—or not taken—by government that are aimed at managing human activities with a view to preventing harmful effects on nature and natural resources, and ensuring that man-made changes to the environment do not have harmful effects on humans" (McCormick 2001). A better and more comprehensive definition is offered by Roberts (2004): "a set of principles and intentions used to guide decision making about human management of environmental capital and environmental services." Noteworthy in this latter definition is that it defines policy as principles and intentions rather than as actions. This definition of *environmental policy* is followed in this paper and in the region-wide study Research on Innovative and Strategic Policy Options (RISPO), implemented by the Institute for Global Environmental Strategies (IGES) in collaboration with several other institutes between 2002 and 2005 (see chapter 2 of this series, King and Mori 2007a). Based on this definition, *policy instruments* are defined as the means by which these principles and intentions are turned into action. These instruments are not necessarily used by public agencies, although they often are.

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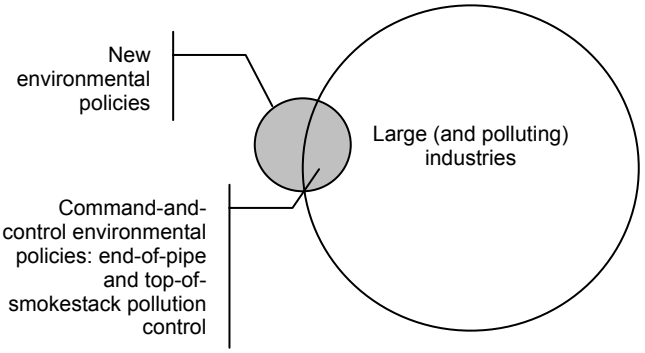

Figure 1. Environmental policy in the 1970s

In developing countries of Asia and the Pacific, policymakers concerned with sustainable development or environmental management are regularly faced with a difficult dilemma: they know that good environmental policymaking requires substantial research and careful balancing of the advantages and disadvantages of various options, and that policies should be tailored to the local culture and implementation capacities. However, they generally have neither the time nor the resources to conduct such thorough, rational analysis. Commonly, policies are made in the wake of some environmental crisis or external pressure: there is a hue and cry; the media picks up the story; the public demands a solution; and the responsible minister ensures that one is provided as quickly as possible. Thus, policy is often made on the fly.

2. The genesis of environmental policymaking

In the late 1960s and early 1970s, a number of environmental crises—the discovery of dangerous concentrations of pesticides in the food chain, the damage to children's brains caused by lead in gasoline, mercury poisoning from industry and gold mining, rising asthma cases due to heavy air pollution, catastrophic oil spills at sea, and others—prompted governments around the world to establish new environmental agencies and to introduce a range of environmental policies that sought to remedy such problems through imposing mandatory standards, requirements, and limits. These would typically target the use of an industrial chemical or emissions from a factory, and were usually aimed at factories and other polluters (see figure 1). The pollution standards adopted under these so-called command-and-control policies were based on laboratory research into the effects, and dose-response relationships, of various dangerous chemicals—some of them in common use—and their breakdown products. Most of these studies were carried out in the United States and Europe, not in developing countries.

In the 1970s, environmental policy was mostly restricted to promoting end-of-pipe or end-of-smokestack solutions, bolting environmental controls onto existing industrial plant. While there was always debate over the economic impacts of such policies, the evidence showed that retrofitting environmental controls rarely bankrupted any industry, especially where virtually all factories in a sector had to meet the same costs. Environmental policy could be seen as a tiny pimple on a very large (and highly polluting) industrial pumpkin.

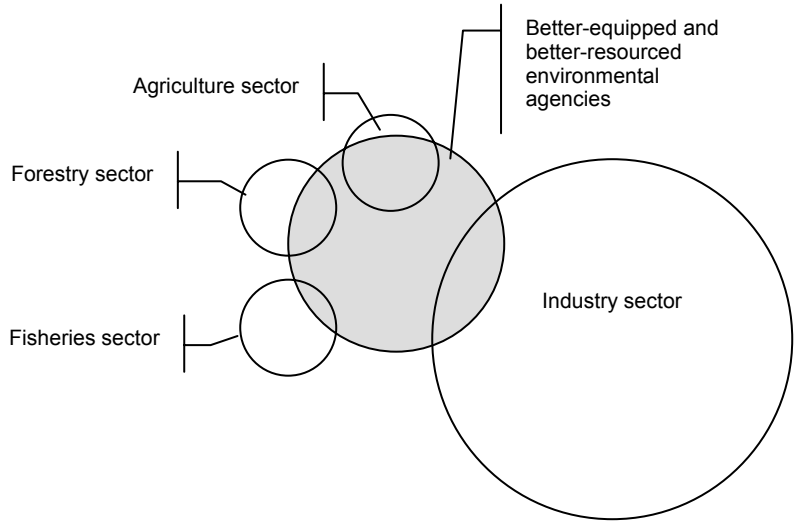

Figure 2. Environmental policy expands in the 1980s

During this time, governments in the developing world generally lagged behind Europe, Japan, and the United States in imposing environmental policies and standards by 5–10 years. In the interim, the research continued, using increasingly sophisticated and sensitive equipment. Generally this led to progressive tightening of standards, and outright banning of many substances for which no safe dose could be found. Developing countries eventually adopted the same types of policies, often due to their becoming signatories of multilateral environmental agreements, pressure from international donors, or media attention generated by non-governmental organizations (NGOs). Local NGOs were suddenly appearing and becoming active at this time, often influenced by international environmental NGOs, or imitating them. When the developing countries did this, they tended to adopt the latest standards in place in Europe or the United States. Thus regulation in developing countries started with the already stringent standards that were applied in developed countries, but without the developed countries' experience in enforcing the earlier, more achievable standards.

3. New aims, new approaches

In the 1980s, as environmental agencies became better equipped and resourced, and the extent of environmental problems became more widely recognized, most governments realized that environmental policies were needed for more than control of industrial pollution. In particular, management of natural resources in the agriculture, forestry, and fishery sectors was recognized as an important environmental concern, especially in developing countries. In many cases, governments tried to make existing sectoral agencies like agriculture, environment, and fisheries ministries adopt environmental management principles and policies, often creating conflicts of interest, as the same agencies were now responsible for both promoting and policing production (figure 2).

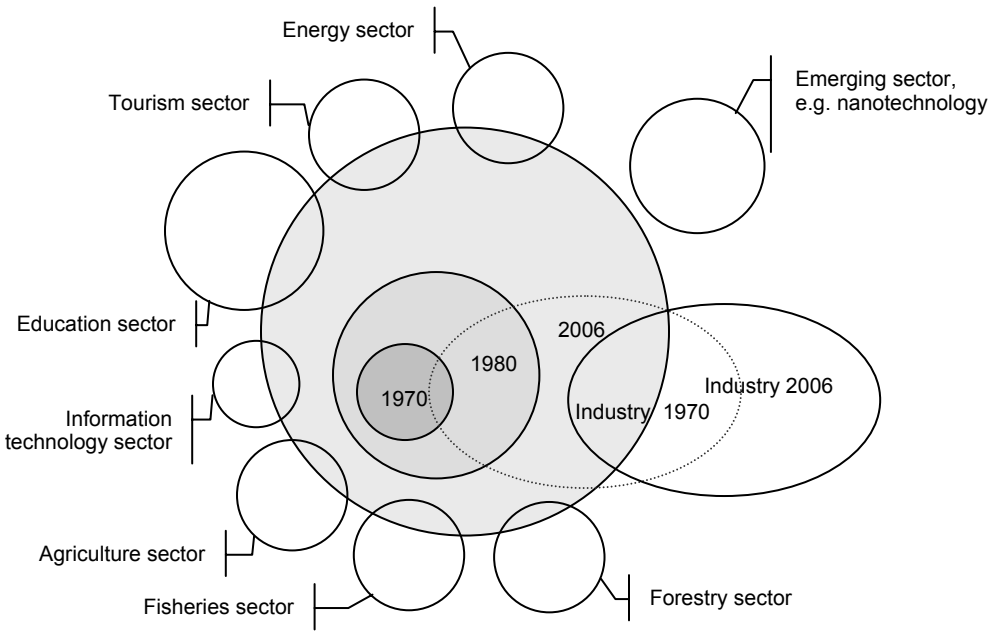

Figure 3. Environmental policy intersects with most sectors by 2006

In the course of the 1990s, environmental policy underwent further shifts. New sectors became more important, industry increasingly moved towards self-regulation, and apart from very new sectors such as nanotechnology there was an environmental policy intersection with virtually all aspects of the economy (figure 3). With concepts of sustainable development resting on three pillars—economic, social, and environmental—it was realized that environmental policy needed to be integrated with the other two areas (see below).

Some time between 1980 and 1990, there was a paradigm shift in the way that governments addressed environmental issues. Governments increasingly realized that command-and-control approaches did not work for all kinds of environmental problems. Environmental damage was seen as fundamentally a market failure due to and the absence of pricing for environmental quality. A "neocapitalist" approach of relying on the power of the market and economic incentives to change environmentally harmful human behavior thus became the new fashion in environmental policy.

Developed countries, typified by the Netherlands, relied on voluntary agreements by industrial sectors to meet specific environmental objectives, while the means of achieving those objectives was left up to the companies concerned. Self-regulation, corporate social responsibility, and self-funded environmental auditing replaced the policing role of early environmental regulators, thus reducing the need for massive increases in staff and resources to meet the ever-expanding mandates of the environmental agencies. Early gains from such policy approaches (essentially from low-hanging policy fruit) convinced many that if only all the market flaws could be removed then the environment would be protected automatically. This new and apparently cost-effective approach was enthusiastically supported by both

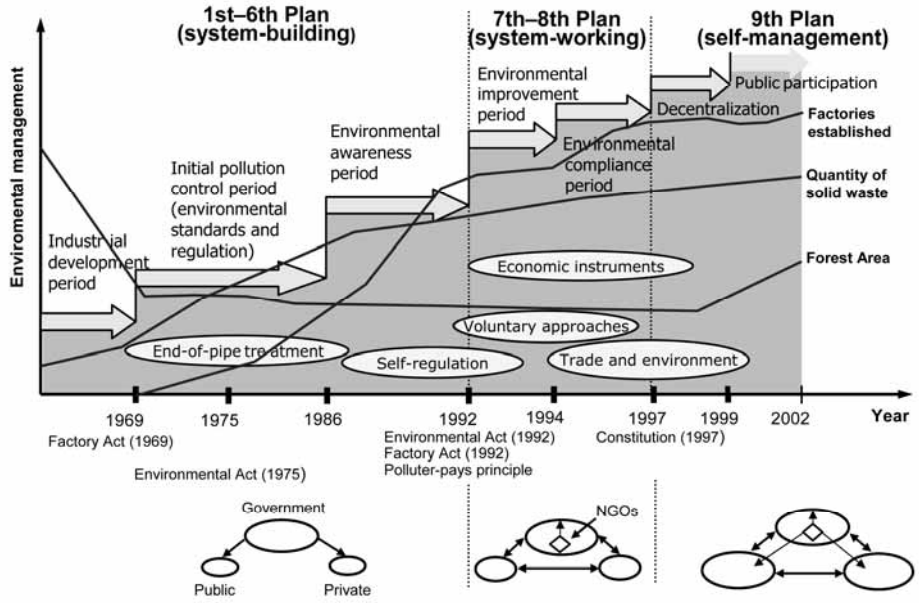

Figure 4. Development of environmental policy trends in Thailand, 1961–2006

Source: Adapted from Chotichanathawewong and Chairattananont 2003.

industries and ministries of finance. Environmental economics became an academic discipline and a route for career advancement. It appeared as if environmental issues were finally being mainstreamed into economic and social planning, aided and abetted by increased public-private partnerships, civil society participation, and decentralization (figure 4).

This new wave of policies is predicated on an underlying assumption that humans will generally respond to the same set of incentives and disincentives in identical ways. However, while physiological responses to a dose of a given pollutant may be more or less uniform in humans, it is highly questionable whether people of all cultures and socioeconomic conditions will have the same behavioral responses. Hence, transferring new-generation environmental policies directly from developed countries is even more problematic than the direct transfer of command-and-control policies was in the 1980s.

At the same time, developing countries no longer have the luxury of postponing environmental policy decisions for a decade while they observe experiences in Europe, Japan, and the United States. The global information and communication revolution, spearheaded by the Internet, means that environmental policies applied in downtown New York today are being studied by NGOs in New Delhi tomorrow. Well-intentioned international donors, in the cause of promoting good governance, promise developing countries large sums of investment funds in exchange for adopting the latest and "best" policy practices. Online databases of these good practices have sprung up everywhere, so the excuse that a policy appropriate to the circumstances could not be found is no longer acceptable. In chapter 2 (King and Mori 2007a) we examine further the processes of environmental policy diffusion and how it is influenced by the information age and the pressures applied by external actors.

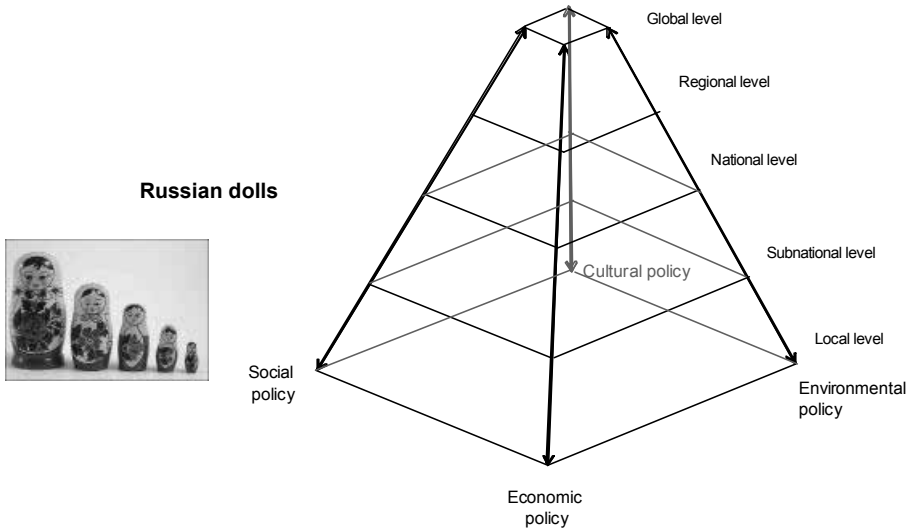

Figure 5. An ideal policy framework: integration of sustainable development dimensions at all levels

Source: Adapted from King, Annandale, and Bailey 2000.

4. Environmental policy and sustainable development

The sustainable development summitry of the 1980s and 1990s propagated the view that integration of environmental management, social dimensions, and economic development at all levels was the ultimate goal of sustainable development. Chapter 38 of Agenda 21[1] defines the overall objective of developing "international institutional arrangements" as "the integration of environment and development issues at national, subregional, regional and international levels, including in the United Nations system institutional arrangements." Chapter 8, on "Integrating environment and development in decision-making," states that its overall objective is "to improve or restructure the decision-making process so that consideration of socio-economic and environmental issues is fully integrated …" Recommended activities include "the integration of economic, social and environmental considerations in decision-making at all levels and in all ministries."

If this set of objectives were actually achieved, then the pattern of environmental policy would evolve into that shown in figure 5, resembling a set of closely fitting Russian dolls.[2] Sustainable development plans would fully integrate environmental, social, economic, and cultural dimensions. There would be one global plan (such as Agenda 21), a handful of regional plans, national plans for all of the countries in the world, several thousand subnational plans, tens of thousands of local plans, and hundreds of thousands of program and project plans. Each layer would be linked at least to the plans above and

1. The agenda for action on sustainable development adopted at the 1992 United Nations Conference on Environment and Development, Rio de Janeiro, 3–14 July 1992. Full text available at http://www.un.org/esa/sustdev/documents/agenda21/english/agenda21toc.htm.
2. Sets of similar-looking painted wooden dolls of decreasing sizes, each of which fits snugly inside the next.

below it, and there would be no conflict between the plans. Spatially, national plans would dovetail together into regional plans and regional plans would combine to form the global plan. The plans at the base level would be very detailed, and those at the top of the pyramid would be very general.

Unfortunately, no ideal society has emerged so far that integrates development plans in such a clustered hierarchy, and probably the effort involved is simply too great for this ever to happen. Environmental policy generally remains a separate field of endeavor and its relationship to economic, cultural, and social activities remains one of mitigating, modifying, or softening the impacts that they create on the environmental domain. The notion of sustainable development, integrating the environmental, social, and economic pillars, therefore remains theoretically and politically attractive but operationally constrained.

The failure of this idealized model of environmental policy and the reality of continuing environmental degradation at all levels has triggered a hasty re-evaluation of the goal of mainstreaming environment in development policy and the domination of environmental policy by economists who would "put a price on everything but know the value of nothing". By the turn of the twenty-first century, it was realized that the new market-based policy instruments needed to be backed up by strong regulatory controls, and that a sophisticated policy mix was necessary to solve environmental problems (Gunningham and Grabosky 1998). Market-based policies and voluntary incentives were only effective if there was a willingness and competitive advantage to self-regulate. Such incentives were often provided, in part, by the threat of introducing tougher command-and-control regulations, which would bind industry in red tape, if industry did not reach required environmental standards through self-regulation. The policy backlash also appears to have been driven by concern, especially among the activist NGO community, that the new environmental policy instruments had not made substantial improvements in environmental quality and many aspects of the global environment were now approaching possibly irreversible thresholds, driven in large part by economically rationalized globalization.

5. Introduction to the RISPO good practices research

To gain a better understanding of how developing countries in Asia and the Pacific have approached environmental policy choices, IGES led the RISPO project (see above). Collaborating with 14 other research institutions in Bangladesh, China, Denmark, India, Indonesia, Japan, Thailand, and Vietnam, RISPO aimed to develop and maintain two online knowledge-based tools—the Good Practices Inventory and Strategic Policy Options—in the expectation that policymakers in developing countries of Asia and the Pacific would find the experience of other countries useful in drawing up their own policies as the need arose. To date, some 139 good practices and about 92 strategic policy options have been documented and are available at the IGES website.[3] See chapter 3 of this series (King and Mori 2007b) for more information about RISPO and the data gathering for the Good Practices Inventory.

3. The RISPO Good Practices Inventory can be accessed at http://www.iges.or.jp/APEIS/RISPO/inventory /db/index.html, and the Strategic Policy Options tool at http://www.iges.or.jp/cgi-bin/rispo/index_spo.cgi.

As the objective of RISPO was to uncover innovative policies and policy instruments as well as cases of other well-known policies being applied in new settings, the case studies and policy options were collected within eight subthemes that are at the cutting edge of policy development trends in Asia and the Pacific and were thought to be likely to demonstrate innovative approaches and policy instruments. The emerging policy trends and the selected subthemes under each trend are shown in table 1, along with the number of good practices collected. Depending on the subtheme, countries in the region that were deemed to have the most appropriate good practices were included in the study. The number of good practices collected under each subtheme within the three-year lifetime of the project varied, being determined by the existence of good cases to study and by the resources available in each country to document them.

Table 1. Emerging policy trends and selected subthemes and good practices

Policy trends	Selected subthemes	Good practices
Accelerating the societal shift to a post-fossil fuel era.	Innovative finance for renewable energy development	17 cases from China and India
	Promotion of biomass energy use	11 cases from India and Thailand
Finding material and energy-efficiency gains outside major industries	Inter-boundary recycling market for enhancing resource-recycling society	23 cases from Brazil, Germany, Japan, Malaysia, the Philippines, South Korea, Taiwan, Thailand, the United Kingdom, and Viet Nam
	Improving environmental performance of small and medium enterprises	20 cases from India, the Philippines, and Thailand
Orienting urban life to ecological principles	Development of environmentally sustainable transport systems in urban areas	22 cases from Brazil, China, Colombia, Ecuador, Japan, Nepal, Singapore, South Korea, and Thailand
Retreat of "big government" and co-option of civil society into natural resource management	Promoting environmental education by NGOs	17 cases from Indonesia and Japan
	Facilitating protected area management using community- based tourism	13 cases from India, Indonesia, Japan, and Thailand
	Promoting sustainable resource management based on local/ indigenous knowledge	16 cases from Bangladesh, mainland China, Hong Kong, Japan, and Thailand

Such a wide variety of cases offered a potentially rich source of information about which environmental policies have been successful and why they have been successful. As well as presenting the good practices and the strategic policy options in database form, it was decided to carry out further research to find out what patterns could be found in the inventory and what lessons these patterns might hold for policymakers in developing countries, especially in Asia and the Pacific. Research methodologies from qualitative research were selected and applied to the good practices in the database, and these are presented in the series of eight linked papers in this special issue of *International Review for Environmental Strategies*. Chapter 2 (King and Mori 2007a) includes further conceptual discussion

about the ways in which countries adopt environmental policies. Chapter 3 (King and Mori 2007b) presents the methodologies used to extract lessons from the RISPO good practices database. Chapters 4–7 present the findings and conclusions of this research exercise in each of four major policy trend areas and eight subthemes of the RISPO Good Practice database (table 1).

The final paper in the series, chapter 8, includes the findings derived by applying textual pattern matching analysis to all of the good practices examined in the research. It also offers the main conclusions and recommendations, identifies additional areas that should be studied in greater detail, and provides general advice to the region's policymakers. Policymakers who are already familiar with the theory of policy diffusion and policy integration may wish to skip chapter 2, although the evidence suggests that these concepts are not well understood in Asia and the Pacific and that the region's policymakers may need a quick refresher course.

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Best Practice on Environmental Policy in Asia and the Pacific: Chapter 2

Policy Selection and Diffusion Theory

Peter N. King[a] and Hideyuki Mori[b]

This chapter discusses how and why environmental policies have changed over time, both internationally and in the developing world. It provides an overview of policy diffusion and policy integration. The main policy paradigms and principles, policy instruments, selection criteria and methods of making environmental policy choices, and factors influencing policy transfers are examined. It is a part of the series of papers in this special issue of the *International Review for Environmental Strategies* (*IRES*), which together constitute a report of a recent research project carried out by the Institute for Global Environmental Strategies (IGES) and several partner institutes to extract lessons for policymakers from the Good Practices database of IGES's Research on Innovative and Strategic Policy Optios (RISPO I).

Keywords: diffusion theory, environmental policy selection, policy selection, policy integration

1. Politics and paradigms

Selecting policies involves choices at two levels: policy paradigms and specific policy instruments. Policy paradigms reflect political ideology and underlying value systems. They tend to change very slowly, as they reflect a society's fundamental beliefs, weighted and balanced by political realities. Trickledown theory, which posits that poverty will be reduced by pursuing overall economic growth that predominantly benefits the rich, is an example of a policy paradigm. A government trying to implement trickledown economics would select policy instruments that fit this paradigm (reducing corporate taxes and so on); state expropriation of the means of production (a policy instrument that could plunge the economy into recession and chaos) and redistribution of the nation's wealth to the poor, while theoretically a solution to poverty, would be rejected.

The influence of political ideology over environmental policy paradigms is also illustrated by the case of the so-called environmental Kuznets curve (EKC). Prior to the emergence of global interest in the environment in the late 1960s and 1970s, a common policy paradigm was based on two fundamental beliefs: that polluting corporations motivated by profit would degrade the environment as long as they could get away with it, and that environmental degradation was an inevitable side-effect of economic development. This latter belief seemed to imply that environmental and economic interests were irreconcilable and developing countries should grow first and clean up later, as many Western countries have done. Unsurprisingly, the appearance of research that seemed to indicate that the environmental degradation caused by economic development actually followed a Kuznets curve (an inverted bell

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shape)—thus, environmental degradation per unit of economic output would rise, peak, and then fall quite rapidly—was enthusiastically welcomed (see Yandle, Bhattarai, and Vijayaraghavan 2004, for example). This credo is clearly expressed by Beckerman (1992): "there is clear evidence that, although economic growth usually leads to environmental degradation in the early stages of the process, in the end the best—and probably the only—way to attain a decent environment in most countries is to become rich."

Among others, the EKC provided further justification for developing countries that had been following a paradigm that implied because today's developed nations had intensively degraded their environments to achieve their current prosperity developing countries should be allowed to do the same.

The EKC remains a popular justification for putting a stronger emphasis on economic development than environmental protection. This is despite the fact that careful econometric studies have shown that the observed phenomena have other explanations and conclusively demonstrate that in most cases the environmental Kuznets curve does not exist:

> It seems that most indicators of environmental degradation are monotonically rising in income though the "income elasticity" is less than one and is not a simple function of income alone. Time related effects reduce environmental impacts in countries at all levels of income. However, in rapidly growing middle income countries the scale effect, which increases pollution and other degradation, overwhelms the time effect. In wealthy countries, growth is slower, and pollution reduction efforts can overcome the scale effect. This is the origin of the apparent EKC effect (Stern 2003).

As briefly touched on in chapter 1 of this series (King and Mori 2007), in the environmental domain there appears to have been a change in policy paradigm in industrialized countries between 1980 and 1990, leading to a sudden upsurge in new 'soft' environmental policy instruments—market-based mechanisms, voluntary agreements, and informational regulation (mandatory disclosure of information) in the early 1990s. Within this new paradigm of "the market knows best", a variety of policy instruments could achieve the same environmental objectives, as long as external environmental effects were internalized.

There is no clear best way to address the sometimes harmful influence of political ideology and underlying value systems on environmental policy. For most policymakers, ideology remains an exogenous factor, a given political system within which they must work. In democracies, the dominant ideology wins through the ballot box and many political parties identify themselves with specific ideologies. As there is no global government (or global democracy), difficulty emerges at the international level, where policy transfer or diffusion may be constrained by conflicting political ideologies. Manno, in a book review essay entitled "Political Ideology and Conflicting Environmental Paradigms", observes that people looking at the same set of environmental conditions often come to very different conclusions about the correct policy responses, depending on how they answer questions such as:

> Do the trends and current state of our air, water, soil, and energy resources call for radical change in how we organize society? Can we instead get by with just some moderate tweaking

> of our legal code? Do we need to rein in the profit-motive or do we need to unleash our entrepreneurial energies to seek new ways of conserving valuable resources, saving money and increasing profits? If we do need radical change, do we need more or less government, or none at all? Do people have inalienable rights to a clean environment, to a satisfying and secure livelihood? How should the costs and benefits of exploiting natural resources be distributed? Who gets to speak for the animals? Is democracy compatible with environmental protection? . . . What's just and how do we measure justice? Are we as human beings inherently good, smart and loving and need only to be freed from oppression, or are we innately destructive, needing harsh rules and strong rulers to keep our dark impulses in check? (Manno 2004)

Politicians are rarely all-powerful arbiters of public opinion but must respond to the dominant ideologies in the country, especially in the growing number of democracies around the world. They are subjected to a wide range of views, especially from lobbyists, and if they stray too far from general public opinion they risk political oblivion. In the domain of environmental policy, ideological differences are often extreme, reflecting not just left-right politics but profound philosophical divisions about the relationship between humankind and nature. Under most circumstances, democracy and the political process may be the best way of bridging these ideological gulfs. As politicians often point out, however, one can only be sure that the middle ground has been found when a politician is attacked equally vociferously by both sides for maintaining a policy position. If that position relates to issues with implications for global survival, such as global warming, then a drawn-out political process may not be the best way of finding optimal policy. Public opinion may come round too late to approve precautionary action that could prevent a crisis. Political leadership and an ability to bring the public to an understanding of the looming crisis may be crucial.

Manno concludes that "creative cross-pollination between apparently irreconcilable positions can only lead to a richer, more nuanced and practical approach" to an ecologically sustainable future. His call to integrate different paradigms (the class paradigm of Marx, the managerial paradigm of Weber, and the individualist paradigm of Durkheim) appears a tall enough order, especially given the struggles to integrate environmental policies into other sectoral policies. However, if we add the notion, put forward by some segments of the deep ecology movement, that modernization may not represent progress at all and we may need to revert to some sort of lost environmental Garden of Eden, then the chances of integration seem dismal.

2. Policy principles

Between the Stockholm Conference on the Human Environment in 1972 and the 1992 Earth Summit (United Nations Conference on Environment and Development, in Rio de Janeiro), the number of principles espoused to guide environmental policies exploded. The Rio Declaration (United Nations 1992) "proclaims" 27 such principles, thus making them international soft law (law that has no binding force). Many of these principles came from, or have since found their way into, international treaties and agreements, some of which have become binding (Caldwell 1996). While many countries in Asia and the Pacific have signed and ratified a wide range of multilateral environment agreements, there is

surprisingly little congruence regarding which agreements and treaties they have adopted (table 1), and even less congruence regarding the translation of the agreements into national legislation. Whether this represents differences in national environmental circumstances or in institutional capacities, or the varying emergence of more democratic forms of government, is unclear. It could, however, also mask real differences in acceptance of the underlying policy principles, although no specific pattern can be seen. Some of the more contentious of the environmental policy principles are discussed in the rest of this section.

Table 1. Signatories to multilateral environmental agreements in Asia and the Pacific and the world, 2005

Multilateral environment agreement	Year of ratification	Signatories in Asia-Pacific (n = 45)	All signatories (n = 195)
Convention on Biological Diversity	1993	45	186
Convention on the Conservation of Migratory Species of Wild Animals	1983	9	85
Convention on International Trade in Endangered Species of Wild Fauna and Flora	1975	3	166
Convention Concerning the Protection of the World Cultural and Natural Heritage	1972	40	177
Kyoto Protocol to the UN Framework Convention on Climate Change	2006	33	125
Vienna Convention for the Protection of the Ozone Layer and its Montreal Protocol on Substances that Deplete the Ozone Layer	1985 (Montreal Protocol 1987)	43	185
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar)	1971	24	141
The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade	1998	13	72
Stockholm Convention on Persistent Organic Pollutants	2004	18	81
UN Convention to Combat Desertification	1996	45	189
UN Convention on the Law of the Sea	1994	33	144
UN Framework Convention on Climate Change	1994	44	188
The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	1989	33	159

Source: UN Environment Programme 2004.

2.1. The polluter-pays principle

In 1974, the Organisation for Economic Cooperation and Development (OECD) adopted the polluter-pays principle—that the cost of repairing damage caused by pollution should be borne by the polluter—calling on all OECD member countries to make it a "fundamental principle for allocating costs of

pollution prevention and control measures introduced by the public authorities in member countries" (OECD 1974). The same OECD document also stated that "as a general rule [member countries] should not assist the polluters in bearing the costs of pollution control whether by means of subsidies, tax advantages or other measures." This recommendation was based on an assumption that the penalties for environmental damage would be sufficient incentive for polluters to invest in pollution-control equipment and less polluting production processes. The polluter-pays principle was restated in the Rio Declaration (as principle 16) and was subsequently incorporated into numerous national and regional environmental action plans (McCormick 2001).

The European Union (EU) realized early on that the polluter-pays principle would not necessarily lead to investment in cleaner production. The main flaws in the argument were identified as (i) that costs could easily be passed on to consumers; (ii) that non-point sources of pollution could not be attributed to a single polluter, by definition; and (iii) that access to publicly funded wastewater treatment systems could not be denied to firms, meaning that taxpayers would pick up part of the cost (McCormick 2001). Another problem with the polluter-pays principle is that, historically, one of the largest polluters has been the state itself; and in many socialist developing countries, the state and state-owned enterprises were responsible for most of the serious pollution. Even if the state chose to make itself pay, it would simply be a case of public funds passing from one department to another, with the taxpayers ultimately footing the bill.

In any case, as long as it is possible for polluters to pass on the costs of pollution control to consumers, penalties have proved generally ineffective in preventing pollution. Once the companies have retrofitted their production facilities (end-of-pipe or top-of-smokestack solutions) or changed their production processes to bring their discharges below whatever standards are in force, polluter-pays policies alone do not provide enough incentive to make further improvements. With economic growth and increased industrial activity, total pollutant loads have inevitably risen. Governments have often decided that the only way to cap the growth in total pollutant loads is to impose ever more stringent standards. Improved science, more sensitive laboratory equipment, and increased evidence that there is no guaranteed safe level for many pollutants have also required strengthened standards. Thus reliance on the polluter-pays principle has too often shifted the cost burden from the polluter to the consumer in a non-transparent manner, after much of the damage has already been done.

2.2. The precautionary principle

Advocates of the precautionary principle argue that those proposing any potentially risky course of action should have the burden of proving it safe before it is allowed to proceed. For example, some governments have decided that because genetically modified organisms may have major health and environmental impacts that are as yet unknown, their developers and promoters should prove that these organisms are safe before releasing them into the environment. This approach turns around the normal obligation on those wishing to forestall an environmentally damaging activity to prove that it is unsafe before the government will take any action to control it.

The precautionary principle has been proposed because many environmental problems have been uncovered decades after a product was introduced into general use—a few examples being asbestos used

in construction, lead in plumbing and paint, mercury in gold mining and felt manufacture, and carcinogenic pesticides and herbicides (Harremoës et al. 2001). Advocates of the precautionary principle argue that the many past mistakes demonstrate that producers cannot be trusted to release new chemicals or materials onto the market without exhaustive testing of all possible environmental impacts.

Opponents of the precautionary principle tend to argue that there are no guarantees in life and that every action involves some degree of risk. They point out that more people die in bed doing nothing than are killed or injured by chemicals or other materials. If the burden of proof becomes too great, then companies will not invest in the research to bring new products to the market, including some that might have environmental benefits. In criminal law in many jurisdictions, everyone is presumed innocent until proven guilty, meaning that the precautionary principle runs counter to a basic legal principle. Another question is what level of risk is acceptable—taken to extremes the precautionary principle could preclude any new technology from being introduced. Furthermore, there is no such thing as absolute scientific proof, as any accepted fact or theory may be falsified by later research.

Despite these reservations, the precautionary principle was incorporated into the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (UN Environment Programme 2000), the 1992 Rio Declaration (as principle 15), and the 2001 Stockholm Convention on Persistent Organic Pollutants (Stockholm Convention 2001), and there is a growing body of case law. In 2000, the EU clarified its position on the precautionary principle, stating that it should not aim at zero risk; the costs and benefits should also be taken into account; and any application of the principle should be provisional pending additional scientific research (European Commission 2000). Perhaps reflecting the difficulties in implementation, the United Nations has tended to back away from wholehearted support of the precautionary principle and prefers to use the term *precautionary approach* (for example in the Rio Declaration).

2.3. Integration principle

The integration principle calls for the dimensions of the three pillars of sustainable development—environmental, economic, and social—to be given due consideration in any policy decision. For the EU, this principle is the "most important and far-reaching of all the basic principles" (McCormick 2001). There are only three other policy areas where the same principle applies: consumer protection, culture, and health. Although the integration principle implies that environmental policy has priority over other policy areas, experience shows that the principle can only succeed where there are adequate institutional mechanisms to promote environmental appraisal of policies from the earliest stages. The Rio Declaration and other global environmental treaties are weakened by a lack of specific guidance on how to integrate environmental policies into other policy areas. Recent reports show that environmental policy integration has not been systematically embedded within the management systems of EU member states (EEA 2005) and that attempts at integration at the regional level are contributing to significant delays in policy formulation (McCormick 2001).

At the 2005 World Summit, the world's leaders stated:

> We also reaffirm our commitment to undertake concrete actions and measures at all levels, including integrating sustainable development in national development strategies and enhancing

> international cooperation, taking into account the declaration of principles of the United Nations Conference on Environment and Development, including the principle of common but differentiated responsibilities (United Nations 2005).

Yet progress reports reveal the futility of maintaining this position. For example, in the Asia-Pacific report on the Millennium Development Goals for the 2005 World Summit, only 5 out of 55 countries had even prepared national sustainable development strategies (ADB/UNDP/ESCAP 2005), of which virtually none were fully integrated into national economic development plans.

As explained in chapter I of this series of papers (King and Mori 2007), integration founders on the naive belief that some idealized version of the Russian dolls approach to policy and planning will emerge from the chaos that currently separate approaches to economic development, environmental planning, and socio-cultural development represent. At best, the integration principle might be interpreted as requiring any new policy, plan, or program to pass through a sequential set of environmental, economic, and socio-cultural screenings, and be rejected if it does not pass any one of these.

2.4. Common but differentiated responsibilities principle

The common but differentiated responsibilities principle set out in principle 7 of the Rio Declaration has made its way into the preambles of many international environmental agreements and treaties, which include a paragraph similar to the following, from the Malmo Ministerial Declaration (Global Ministerial Environment Forum 2000):

> Convinced that urgent and renewed efforts are required to be undertaken by all countries in a spirit of international solidarity, and recognizing, inter alia, the principle of common but differentiated responsibility as contained in the Rio Principles to manage the environment so as to promote sustainable development for the benefit of present and future generations.

The common but differentiated responsibilities principle is based on the concept that the earth is a common heritage of humankind and on the general principles of equity in international law, combined with a recognition that different countries, essentially divided into developed and developing countries, have differing economic and technical capacities to contribute to the common stewardship responsibilities for the planet.

Principle 7 of the Rio Declaration states that:

> In view of the different contributions to global environmental degradation, states have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command (United Nations 1992).

The notion of common concern (or the global commons) inherent in this principle covers shared resources, like transboundary rivers; resources not under the control of any state, such as space or the open seas; and resources under the control of a sovereign state but subject to common global concern, such as biodiversity or protected species.

The second element of the principle, differentiated responsibility, reduces the obligation on developing countries. If globally agreed standards or protection measures are considered too onerous for developing countries, or these countries have special needs such as for additional technical assistance, then they may be given exemptions or additional time to comply, or be compensated for the implicit burden imposed by developed countries. One wonders how many of the several hundred international environmental agreements would have been abandoned but for this principle being applied. The principle has paved the way for the seemingly endless negotiations on burden sharing and fragmentation typified by the UN Framework Convention on Climate Change and the Kyoto Protocol. On the other hand, these asymmetrical rights and responsibilities have ensured that international environmental agreements have not been reduced to the lowest common denominator and have provided the impetus for the establishment of international environment funds such as the Global Environment Facility (GEF).

2.5. Other principles

Some other principles, all of which appear in the Rio Declaration, are of interest from an environmental policy perspective (United Nations 1992):

The anthropocentric principle (Rio principle 1)

> 'Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature' (Rio principle 1). The alternative, ecocentric, principle, in which humans are seen as just one part of nature, has not been incorporated into international policy domains, much to the chagrin of the adherents of deep ecology, among others (see below).

Do no harm to others (Rio principle 2)

> States have …. the sovereign right to exploit their own resources . . . and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other states or of areas beyond the limits of national jurisdiction.

The intergenerational equity principle (Rio principle 3)

> The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations.

The right to information and participation (Rio principle 10)

> Sustainable development is best achieved when all citizens have access to information and the legal right of redress and remedy for environmental harm.

The market failure principle (Rio principle 16)

> Where there are externalities (unintended effects on others for which no payment or compensation is made), the environmental costs through the use of economic instruments should be internalized. Market failure occurs when market forces alone do not serve the public interest. Most

forms of environmental pollution can be externalities if there are no legal or economic mechanisms for penalizing polluters for their impacts on common goods or on private property

The good neighbors principle (Rio principles 18 and 19)

States shall immediately notify other states of any natural disasters or other emergencies that are likely to produce sudden harmful effects on the environment of those states. …

States shall provide prior and timely notification and relevant information to potentially affected states on activities that may have a significant adverse transboundary environmental effect and shall consult with those states at an early stage and in good faith.

If there are natural disasters, environmental emergencies or transboundary environmental problems that will affect a neighboring state, then states should not only provide timely warnings but should also help them recover.

2.6. Controversies over the principles

Most of these principles are not much more than expressions of the principles of common courtesy between countries, but some remain deeply controversial and/or difficult to translate into national policy. In particular, there are the inherent contradictions between *ecocentric* (nature first) and *anthropocentric* (humans first) principles, which raise fundamental philosophical questions. A possible bridge between the two views is acceptance that humans cannot exist without healthy ecosystems, making it immaterial whether we protect ecosystems because we value biological diversity for its own sake or because we value our own lives. However, no ecological tipping point, beyond which ecological degradation will doom human life to oblivion, has been scientifically defined, so there is an understandable view that we still can and will find appropriate environmental solutions in time. To bring the two sides of the argument together, therefore, requires conclusive proof about the actual value of healthy ecosystems as well as definition of tipping points. Additional work along the lines of the Millennium Ecosystem Assessment is, therefore, crucial to reconciling these principles.

Many environmental philosophers, animal rights activists, and adherents of deep ecology are troubled by the notion that human beings are "at the centre of concerns for sustainable development" (de-Shalit 2000). They believe not only that humans should avoid treating animals cruelly as a matter of principle but also that animals have innate rights in the same way that humans have rights. As increasing evidence of the narrowness of differences between humans and animals emerges (for example, overlap of genes, use of tools, memory capabilities, ability to learn sign language, social organization, and the ability to register pain), the anthropocentric principle can be expected to come under increasing attack.

Economists, among others, have difficulty in accepting the *intergenerational equity principle*. The time preference of money shows that any cost or benefit more than about 30 years into the future can be effectively discounted to zero. Economists argue that all past generations have accepted the earth as they found it and transformed what they have inherited to meet their own needs, and that there is no special case for humanity to forgo current benefits or consumption of resources so that these benefits or resources are left for some undefined future generation. Logically, they ask, if a resource is so important

that it cannot be used by this generation, how could any future generation then decide that it was time to use it rather than pass it on to the next?

Three interlocking principles form the basis of intergenerational equity. First, each generation should conserve resource diversity so that it does not unduly restrict the options available to future generations. Second, each generation should maintain the quality of the planet's resources so that they are passed on in no worse condition than they were received. Third, each generation should have equitable rights of access to the legacy of past generations and conserve this access for future generations. Economists are still grappling with these concepts and have proposed various formulations that would make both economic and environmental sense, such as treating non-renewable resources as capital stocks and ensuring that any use of capital provides an equivalent investment in renewable resources. Others have suggested altering the discount rates for projects that will have benefits or costs far into the future. However, operational policies for such theoretical treatments are still generally missing at the national government level.

An overarching principle that is gradually and controversially feeding through UN processes is that all people have a fundamental and equal *right to a quality environment*. This elevates environmental rights to the same status as other human rights such as freedom from oppression and fear, free speech, and freedom of association and assembly (Chapman and Sage 2002). Of course, the right to a quality environment implies a corresponding duty to protect the environment; failure to do so would, logically, be a violation of human rights. The impetus for this emerging recognition stems from a report of the special rapporteur to the Commission on Human Rights in 1994, which stated that most existing environmental and human rights principles "embody the right of everyone to a secure, healthy and ecologically sound environment" (Ksentini 1994). Her report included, as an annex, the first ever declaration of principles on human rights and the environment. This includes rights to freedom from pollution; protection of ecosystem services; safe food, water, and working environments; adequate housing, land tenure, and living conditions; information on the environment and participation in decision making; and effective remedies and redress in the courts. The notion of amending international law to embody these rights remains deeply controversial, but there has been some progress, as outlined below.

In 1988, the Commission on Environmental Law of the World Conservation Union (IUCN), in cooperation with the International Council on Environmental Law and the Environmental Law and Institutions Programme Activity Centre of the United Nations Environment Programme (UNEP), started work on drafting an International Covenant on Environment and Development, which is intended to become a set of fundamental principles and to consolidate into a single juridical framework all existing principles and soft law on environment and development (World Conservation Union 2004). They have taken as their model the progression from the soft law 1948 Universal Declaration of Human Rights to the legally binding 1966 Universal Declaration on Human Rights. Article 12 of the current draft, presented to the 59th session of the UN General Assembly in 2004, includes the following:

1. Parties undertake to achieve progressively the full realization of the right of everyone to an environment and a level of development adequate for their health, well-being and dignity.
2. The Parties shall ensure that all natural and juridical persons have a duty to protect and preserve the environment. (World Conservation Union 2004)

In 2002, the Center for Human Rights and the Environment (CEDHA) and the Center for International Environmental Law prepared a draft of international legislation on human rights and environment (Center for Human Rights and the Environment 2002). While the main intention was to have the legislation applied in the American hemisphere, a broader aim was to provide a basis for further international debate on the need for such legislation at the global level. In 2003, the UN Commission on Human Rights passed a resolution on Human Rights and the Environment, as Part of Sustainable Development, which reaffirmed that "peace, security, stability and respect for human rights and fundamental freedoms" were essential for achieving sustainable development. It also called on all states to "protect the legitimate exercise of everyone's human rights when promoting environmental protection and sustainable development" (UN Commission on Human Rights 2003).

Finally, the *market failure principle* has made considerable headway in recent years. Several examples are given later in this chapter regarding the treatment of market-based policy instruments. More problematic is the associated notion that ecosystems provide a wide range of services that have rarely entered markets (such as fresh air, forested watersheds, soil microbes, coral reefs, mangroves, and the ozone layer) (Murtough, Aretino, and Matysek 2002) but should have their true values recognized. The Millennium Ecosystem Assessment systematically examined these ecosystem services and found two-thirds of them to be in decline (Millennium Ecosystem Assessment Board 2005). A rough estimate made in the late 1990s of the total value of ecosystem services and natural capital—$16–54 trillion per year (Costanza et al. 1997), most of which was outside the market—possibly exceeded the global gross national product of about $18 trillion per year at that time. If two-thirds of the world's largest firms were in decline, then it would be an unprecedented global crisis, exceeding the depression of the 1930s, but somehow the enormity of the Millennium Ecosystem Assessment's findings has yet to sink into the public consciousness. To accept fully the idea that much of the real global economy is in permanent decline has such far-reaching implications that humanity is arguably in a state of denial (Gray 2006). As observed by Costanza and his co-writers, "As natural capital and ecosystem services become more stressed and more 'scarce' in the future, we can only expect their value to increase. If significant, irreversible thresholds are passed for irreplaceable ecosystem services, their value may quickly jump to infinity," (Costanza et al. 1997).

3. Policy instruments

The online General Multilingual Environmental Thesaurus maintained by the European Environment Information and Observation Network (http://www.eionet.europa.eu/GEMET) offers the following definition for *policy instrument*: "the method or mechanism used by government, political parties, business or individuals to achieve a desired effect, through legal or economic means." It also offers this definition for *environmental policy instrument*: "technological, economical and legislative measures employed to prevent or control pollution or damage of the environment." Based on these definitions, we

can view environmental policies as stating an intention, principle, or objective (drawn from some fundamental paradigms) and environmental policy instruments as the ways and means to realize those intentions, objectives, or principles. While they imply action, environmental policy instruments can be implemented by any actor or group of actors and are not confined to actions carried out by governments.

As can easily be imagined, if there is a huge range of environmental policies and several alternative ways to achieve any environmental objective, then there must logically be thousands of possible environmental policy instruments. To handle this complexity, there have been numerous attempts to classify environmental policy instruments, ranging from the simplistic—"sticks, carrots, and sermons"—to the more complex. One of the more useful attempts to do this is reproduced in table 2.

For the Research on Innovative and Strategic Policy Options (RISPO), a slightly simpler classification was used:

(a) *Regulatory instruments*, such as:

(i) Command and control: a regulatory regime where governments attempt to control those who would damage the environment in some way—typically employing rules, regulations, standards, policing, and compliance; and

(ii) Direct provision: governments use fiscal resources to invest directly in environmental infrastructure or other forms of environmental protection, often recouping the capital cost through user charges.

Table 2. Examples of typical environmental policy instruments, in the areas of natural resource management and pollution control

	Environmental policy domain	
Policy instrument	Natural resource management *water, fisheries, agriculture, forestry, minerals, biodiversity*	Pollution control *air pollution, water pollution, solid waste, hazardous waste*
Direct provision	Provision of parks, public water supplies	Provision of landfill, wastewater treatment plants
Detailed regulation	Land use zoning Closed seasons and restrictions on equipment (fishing, hunting) Bans on trade in ivory, tiger bones, wildlife, etc.	Obligatory use of catalytic converters Traffic regulations and speed limits Bans on toxic chemicals
Flexible regulation	Water quality standards	Fuel quality standards
Tradable quotas and rights	Individually tradable fishing quotas Transferable use rights for land	Emission permits Carbon and sulfur trading
Taxes, fees and charges	Water tariffs Park entry fees Fishing licenses Stumpage fees	Waste fees Road congestion pricing Petrol taxes Industrial pollution charges
Subsidies and subsidy reduction	Fishing boat subsidy reductions Agriculture subsidy reductions Landscape protection subsidies	Renewable energy subsidies Reduction in non-renewable energy subsidies Seed funding for renewable energy technologies
Deposit-refund schemes	Reforestation deposits or performance bonds Mine rehabilitation reserve funds or bonds	Container deposits and refunds Vehicle inspections Construction bonds
Refunded emissions payments		Nitrogen oxides abatement
Creation of new markets and property rights	Eco-tourism Intellectual property rights for indigenous knowledge Privatized national parks Organic agriculture	Industrial ecology Recycling Environmental goods and services industry
Common property resource management	Community-based tourism Traditional resource management Fish sanctuaries	–
Legal liability and insurance schemes	Liability bonds for mining Disaster insurance	Liability bonds for hazardous wastes
Voluntary agreements	Sustainable forestry agreements Codes of practice	Phasing out toxic chemicals Industry codes of practice Life cycle analysis
Informational regulation	Eco-labelling Forest certification Organic agriculture certification	Energy rating of appliances Pollution performance rating of industries
International treaties and agreements	On forest principles On Law of the Sea On combating desertification	On ozone-depleting substances On persistent organic pollutants On climate change On transboundary movement of hazardous materials
Macroeconomic policies	Structural adjustment Population policies	Trade policy Industry policy

Source: based on Sterner 2003.

(b) *Economic instruments*, such as:

(iii) Market-based instruments: the power of the market is used to change the behavior of producers and consumers towards environmental protection—typically charges, taxes, tradable permits, and subsidies; and

(iv) Creation of new markets: governments attempt to overcome market flaws (or the absence of markets) by promoting new markets or property rights—typically financial incentives, assignment of property rights, quotas, green procurement, and seed funding.

(c) *Social instruments*, such as:

(v) Voluntary agreements: firms or industry associations enter into some form of voluntary agreement or code of practice designed to protect the environment; and

(vi) Informational regulation: information about environmental conditions or environmental performance is provided to the public so that they can take informed decisions on how to react.

These rather artificial divisions, however, tend to mask the need for different types of policies to work in concert, through an appropriate policy mix. For example, as discussed in chapter 1, voluntary agreements are rarely successful unless there is at least the threat of a regulatory response if the voluntary approach fails.

4. Policy transfer and diffusion

There appear to be three main avenues for selecting appropriate policy instruments: (i) innovation—finding completely new solutions; (ii) borrowing from, or emulating, existing policies in other sectors within the country; or (iii) transferring successful policies from other political jurisdictions or countries. There is ample evidence that many countries have followed this latter course and learned from each other in adopting new environmental policy instruments through a process of international policy transfer. In the literature, a distinction is made between policy diffusion and policy transfer.

Policy diffusion is "the process by which policy innovations are communicated in the international system and adopted voluntarily by an increasing number of countries over time," (Rogers 2003). One mode by which policy diffusion works is *policy transfer*, "the process by which actors borrow policies developed in one setting to develop programmes and policies within another," (Dolowitz and Marsh 1996). Policies, and policy instruments, are rarely original ideas and are usually borrowed or adapted from other settings or other sectors. In the fields of political science and international studies, *lesson-drawing*, and *policy convergence* are also described as part of policy diffusion. All of these concepts are concerned with "the process by which knowledge about policies, administrative arrangements, institutions and ideas in one political system (past or present) is used in the development of policies, administrative arrangements, institutions and ideas in another political system," (Dolowitz and Marsh 2000). While Rose (1991) uses the term *lesson-drawing* to describe the overall process of transfer of policy and institutions, Dolowitz and Marsh (1996) and Stone (1999) do not agree on the interchangeability of *lesson-drawing* and *policy transfer*, suggesting that policy transfer is actually a

broader concept encompassing ideas of diffusion and coercion as well as voluntary lesson-drawing (Stone 1999).

Of particular interest in the environmental arena is the common practice of developing countries adopting environmental policies from developed countries. As noted in chapter 1, early command-and-control policies, where setting environmental standards was a crucial element, routinely saw developing countries borrowing excessively stringent standards that could not be implemented. Across the 48 OECD and Central and Eastern European countries there has been remarkable convergence of environmental policies: policy convergence has taken place in air, water, and soil protection laws, and waste management laws, with almost total convergence reached in each of these areas in 43, 43, 38, and 31 years respectively (Tews, Busch, and Jörgens 2001). This suggests that similar environmental policy convergence is likely to accompany emerging economic integration in Asia and the Pacific.

Policy transfer opportunities are increasing due to current trends in political and commercial globalization and technological advances, especially in information technology (Dolowitz and Marsh 2000). The value of policy transfer is emphasized by the emergence of "new" policy problems "that cannot be dealt with effectively through established domestic policy heuristics," (Stone 1999). Tews, Busch, and Jörgens (2001) investigated the transfer of several new environmental policy instruments, including eco-labelling, carbon taxes, free access to environmental information, and national strategies for sustainable development. They found that free access to information and national strategies suddenly took off in about 1990, and by the time of their study in the OECD and Central and Eastern Europe about 38 countries had such legislation and plans. Eco-labelling grew quickly between 1987 and 1992, but had leveled off at about 29 countries. The first national environmental plans were in Denmark (1988) and the Netherlands (1989), the first eco-label was the Blue Angel label in Germany (1978), and the first law on freedom of access to (environmental) information was in Sweden (1949).

It is interesting to contrast these instruments with energy/carbon taxes, which were first implemented in the Netherlands in 1988 but have so far only been adopted by about 13 countries. Tews, Busch, and Jörgens point out that demands for an energy tax on fossil fuels were first raised in the 1970s, but really only found a mild degree of support since the 1990s; "The introduction of effective economic instruments regularly fails where powerful, well organized economic interests are the potential losers of such a strategy," (Tews, Busch, and Jörgens 2001). In general terms, redistributive policies—where there are clearly defined winners and losers—are much more difficult to implement than non-redistributive policies, such as provision of information.

Policy transfer can occur at and between any of the following levels: international, transnational, national, regional, and local (Evans 2004b). One of the shortcomings of existing policy transfer literature is that it focuses on policy transfers between the developed North and and pays little attention to policy transfer in the developing South (Evans 2004a, 2004b; Nedley 2000; Rose 1991; Stone 1999).

There have been relatively few attempts to address the lack of a South perspective in the literature. Nedley (2000, 2004) examined the potential for policy transfer (in the form of lesson-drawing) from the South to the North through comparative analysis of two case studies in England and one in Tanzania, showing similarities in approach to health-sector reform. Lana and Evans (2004) applied a multilevel

approach for investigating processes of South–South transfer, taking as an example the transfer from the Federal District of Brasília to the Ecuadorean national government of the Bolsa-escola program, which provides monthly cash payments to mothers in low-income households on the condition that all children of school age are sent to school regularly. Still, there is a dearth of literature on the process of South–North and South–South policy transfer and there is a need to expand the policy transfer framework to adopt a more global perspective for analysis (Nedley 2000, 2004).

For Asia and the Pacific, the issue of South–South and South–North policy transfer is of particular interest (see chapter 6, Matsumoto, King, and Mori 2007).

4.1. Policy selection criteria and methods

As we have seen above, values and preferences, whether revealed or not, are important in making policy choices. According to de-Shalit (2000), where these values and preferences are revealed through market mechanisms, traditional cost-benefit analysis can be used to find optimum policy choices. More often than not, however, environmental policies fall outside strict market domains and must attempt to deal with cases of market failure. In this territory, "environmental policies should be made with reference to people's values, as expressed in political debates about the good, rather than by reference to their preferences, as expressed in market behavior" (de-Shalit 2000). The competing claims of shared values regarding consumption and shared values regarding nature and its protection cannot be resolved merely by putting a price on everything we value as ethical, future-oriented citizens. The aggregation of individualistic preferences revealed through "willingness to pay" or "willingness to accept compensation" does not capture the part of our collective will that looks beyond selfish needs and desires—indeed beyond our own lifetime to the needs of unborn generations. The environmental policy choices that relate to societal values, therefore, are the proper domain of politicians rather than of environmental economists.

How then can policy analysts assist the politicians who are faced with these difficult choices, who must attempt to balance widely divergent sets of values? Even more importantly, how can we avoid questions of environmental values being transformed into easier questions of resource allocation, which can be conveniently slotted into the most accommodating part of the political spectrum? For example, if biodiversity is valued for its intrinsic value—and not some quasi-use value—how can political decisions about biodiversity not be reduced to merely increasing the budget for protected area management? As de-Shalit argues, decisions such as these that are based on values—not just economic value—must evolve from the grassroots and be non-negotiable. "By critically scrutinizing each and every policy, citizens will not allow (political) parties to turn value-related, bottom–top issues such as the 'environment' into resource-related issues." (de-Shalit 2000). Policy choices are not merely trade-offs between economic growth and environmental protection, but rather choices that allow both to proceed.

At the 2005 World Summit, more than 150 heads of state reaffirmed their commitment to sustainable development.

> . . . to this end, we commit ourselves to undertaking concrete actions and measures at all levels . . . these efforts will also promote the integration of the three components of sustainable

development—economic development, social development and environmental protection—as interdependent and mutually reinforcing pillars.

The concept of sustainable development, therefore, is bound up with the notion of integrating social, economic, and environmental dimensions of development, at the levels of policies, plans, and programs. While this notion makes for easy sound bites, it has proved more difficult to operationalize. Perhaps the EU has tried harder than most to integrate environmental policies into other sectoral policies. Environmental integration was accepted as a basic EU principle in the 1986 Single European Act and further strengthened by the 1992 Maastricht Treaty. However, by 1994 a European Commission review of implementation of the Fifth Environmental Action Program found that there was a "lack of willingness to adequately integrate environmental and sustainable development considerations into the development of other policy actions." (European Commission 2004). The Cardiff Process, launched at the June 1998 meeting of the European Council in Cardiff, UK, aims to integrate environmental considerations into the policies and activities of the various Council formations. A stocktaking of the Cardiff Process almost 10 years later found that the profile of environmental integration had been raised but "environmental integration commitments are still largely to be translated into further concrete results for the environment" and the Cardiff Process had failed to deliver fully on expectations (European Commission 2004; European Environment Agency 2005).

The EU stocktaking also found that the Cardiff Process was hampered by a general lack of consistency; weak political commitment; poor delivery, implementation, and review mechanisms; a need for clearer priorities and focus; and a need to adopt a strategic, forward-looking approach. However, there was no lack of tools available to undertake the task. If over a period of 20 years the EU has failed to integrate environmental policies into other sectors, then one can only imagine how little progress has been made in developing countries.

4.2. Multi-criteria analysis

As part of the EU Sustainable Development Strategy, a system of extended impact assessment has been in place since 2003 for all major policy proposals (European Commission 2002, 2005). The objective of extended impact assessment is to "improve the quality and coherence of the policy development process," (European Commission 2002). It identifies the impacts (positive and negative) of proposed policy actions presented in the Annual Policy Strategy or the work program of the European Commission. A common set of basic questions, minimum analytical standards, and a common reporting format are specified in the recently released Impact Assessment Guidelines (European Commission 2005).

Critically scrutinizing policies, however, should not be an ad hoc, unguided process, dictated by the loudest or most insistent voice. The standard process of policy scrutiny is to set environmental goals, formulate a set of alternative environmental policies to achieve those goals, and then select and implement the optimal policy solution, according to a list of (weighted or unweighted) decision criteria. Some typical criteria used for policy evaluation are economic efficiency, cost-effectiveness, incentives for entrepreneurship, enforceability or ease of implementation, fairness/equity, compatibility with other

policies, political acceptance, sustainability, replicability, and impact or relevance in relation to the goals (IGES 2005; Latacz-Lohmann 2001).

If social and ecological perspectives are not to be squeezed into the cheapest option based on monetization of these decision criteria, what other filters or screens might be used? In the past few decades, various forms of multi-criteria analysis and participatory decision models (such as value trees or Delphi methods) have been proposed to ensure that multiple-preference rankings and relative priorities can be considered, but these generally also search for the optimal solution from among a predetermined set of options. Stahl, Cimorelli, and Chow (2002) note that all optimization processes currently used tend to downplay the importance of learning as a stage in the policy process. They propose instead a multi-criteria integrated resource-assessment approach that allows stakeholders to shape criteria, ranking, and options according to their knowledge and perspectives, as well as learning from the scientific data. In this approach, all decision criteria are indexed to a common scale using social value judgements and the criteria are then weighted through pair-wise comparisons. By combining the indexed criteria and the relative weighting, the overall preferences among the decision criteria are ranked. Instead of a single best choice, the analytic hierarchic process produces an array of outcomes or options, dependent on the stakeholder-determined weighting, which also provides further opportunities for learning by the participants. They claim that conflict resolution and consensus building are facilitated by this learning environment.

Selecting policies or policy options for one issue at a time is probably the norm for most policymakers. However, where one set of policies interacts with another in a different sector—whether in a conflicting or reinforcing manner—the policy selection process becomes much more difficult. For example, energy policymakers promoting renewable energy may choose wind energy as the most cost-effective, efficient, and politically acceptable option (an outcome common in Europe). Environmental policymakers may, however, raise objections on the basis of concerns over noise pollution, landscape blight, and bird kills. Carbon dioxide geo-sequestration as an industrial policy response to global warming may not be the most cost-effective option for reducing the release of greenhouse gases to the atmosphere, but such a policy could be selected if it were demonstrated that geo-sequestration was also the best environmental policy response.

Given the potential for conflict between energy and environmental policies, Greening and Bernow (2004) note that a consensus needs to be

> . . . identified by balancing short- and long-term objectives (e.g., provision of reliable sources of low-cost energy, reductions in levels of emissions, adaptation to an altered economic, social, or physical environment, the collection of additional information, the absence of action etc.), the timing of those actions, the geographic location of those actions, burden-sharing or equity, and the relationship of policies and actions to other important social and environmental goals.

They propose a multi-criteria decision-making method as the best way of describing and evaluating a problem, formulating and considering different aspects of the problem, assessing the importance and relevance of these aspects in a consistent way (without reducing them to a dollar value), and including values of multiple stakeholders.

However, to "design environmental and energy policies which achieve multiple objectives and are coordinated in their results, a new class of models must be used," (Greening and Bernow 2004). Generally referred to as "integrated assessment" models, when combined with more than one multi-criteria decision-making method, this new class of models could help to develop integrated sectoral and environmental policies.

5. Conclusion

The evidence indicates that many developing countries have looked to other more developed (and occasionally other developing) countries as sources of inspiration for their own environmental policies. This suggests that research on defining best practice environmental policy and policy instruments will provide useful input to policymakers and will hasten global convergence of environmental policy. However, if the underlying social and cultural values do not also converge, there may be a mismatch between the adopted policies and the commitment to enforcement and compliance.

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Best Practice on Environmental Policy in Asia and the Pacific: Chapter 3

Researching Environmental Policy in Asia and the Pacific: Lessons from the RISPO Good Practices Inventory

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This chapter introduces and describes the methodology used in a recent research program aimed at identifying useful lessons about what has made environmental policies successful in developing countries, particularly in Asia-Pacific. These lessons are intended mainly for policymakers. The study used qualitative research methods, including textual pattern matching, to analyze more than 100 good practices in the area of environmental policy that comprise the Good Practices database of the Research on Innovative and Strategic Policy Options (RISPO) project of the Institute for Global Environmental Strategies (IGES). This paper outlines how the original good practice case studies were gathered and documented and then the stages of research and analysis in the current study. It is intended as a part of the series of eight linked papers in this special issue of the *International Review for Environmental Strategies* (*IRES*).

Keywords: case study analysis, pattern matching, environmental policy, social learning

1. Introduction: Background to the study

Some writers have suggested that national institutions cannot and should not be entrusted with making policy decisions about environmental issues that affect the entire planet. For example, Ho-Won Jeong (2001) argues that "global interdependence requires limits on political sovereignty and the state's pursuit of its own self interest." Instead, these writers propose that global governance is the only answer to many of today's most pressing environmental issues. However, if convergence between the environmental policies of different states, particularly between those of the North and those of the South, can be accelerated through improved social learning, then it might be possible for the desired ends to be achieved through policy at the national level. In any case, there is no evidence that states have any intention of ceding sovereignty over environmental management to any international authority.

From the literature, it is evident that nations do learn from one another in environmental policy and related domains, sometimes voluntarily, sometimes under pressure from a wide range of actors. However, the process as it is practiced today appears to be rather hit-or-miss, as differing national characteristics—such as culture, politics, policy styles, institutional capacities, influence of vested interests, and level of public support—can make poorly thought-out or inadequately researched policy transfers not only ineffective but

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also highly costly for affected industries and communities. For example, the global ban on the insecticide DDT (without adequate alternatives in place) probably needlessly condemned millions of people to contract malaria (Lapkin 2003). Few developed countries have any formal comprehensive policy appraisal system in place; developing countries are even more prone to shooting in the dark. Provision of policy information in a form that facilitates policy convergence between countries should, therefore, be a global priority.

In 2005–2006, researchers at the Institute for Global Environmental Strategies (IGES) carried out a study to find lessons that could be useful for environmental policymakers in Asia and the Pacific, based on common features found in 139 case studies of good environmental policy practice. These good practices had been gathered and documented by the Research on Innovative and Strategic Policy Options (RISPO) project between 2002 and 2005. The RISPO project's findings about good practices and strategic policy options were presented at an annual conference of environmental ministers and senior officials, ECO-ASIA (the Environment Congress for Asia and the Pacific) 2004, and at several other international forums. They are also available via the IGES website.[1] However, IGES realized that if these remained the only means of dissemination of the Good Practice data, there was a risk that their full potential to prevent inappropriate policy instruments being chosen by inexperienced governments would not be realized —bringing the evolutionary process of environmental policy in disrepute and wasting scarce national resources.

The overall aim of this study was therefore to draw from the RISPO Good Practice Inventory database some useful guidance to policymakers about how to choose an optimal mix of policy innovations: how governments and other stakeholders in developing Asia and the Pacific, given the wide range of choices available, can decide on the most appropriate set of environmental policies for their particular circumstances, which will combine with existing policies to hasten the shift towards sustainable development.

This chapter provides some reflections on the processes of policy selection and social learning in Asia-Pacific. It then outlines the ways in which the good practice cases were selected and documented in the original RISPO study and describes in detail the methodology used to identify common patterns and lessons. The other chapters in the linked series presented in this special issue of the *International Review for Environmental Strategies (IRES)* provide conceptual background and findings when similar methodologies were applied to various policy themes and to the RISPO Good Practice database as a whole.

2. Social learning and environmental policy

The issue of social learning from environmental policy pioneers has been addressed by several studies on policy diffusion (for example, Busch, Jörgens, and Tews 2004; Tews, Busch, and Jörgens 2001). Policy convergence between countries is common. Not only did command-and-control regulation and the creation of new environmental agencies emerge along similar lines in different countries in the 1970s and 1980s, but also the new environmental policy instruments—market-based instruments,

1. The RISPO Good Practices Inventory can be accessed at http://www.iges.or.jp/APEIS/RISPO/inventory /db/index.html, and the Strategic Policy Options tool at http://www.iges.or.jp/cgi-bin/rispo/index_spo.cgi.

voluntary agreements, and informational regulation (see chapter 2 of this linked series of papers: King and Mori 2007b)—appear to be on equally parallel tracks (Jordan, Rüdinger, and Zito 2003).

Busch, Jörgens, and Tews (2004), in a study that examined 20 instruments from 43 countries suggest that the global spread of the new environmental policy instruments is due to diffusion of a new regulatory paradigm, and has been accelerated by the increased free access to information offered by the Internet. At the micro level, they say, such diffusion appears to be driven by "processes of social learning, copying or mimetic emulation." There is some disagreement, however, about how far such convergence happens through essentially voluntary adoption and adaptation of policies and how far it is coerced. According to Tews, Busch, and Jörgens (2001), convergence can generally be attributed to the inner dynamics of international policy diffusion, which make it difficult for countries to ignore the adoption of new environmental policy instruments by forerunner countries. Despite the fact that environmental problems—and perceptions of their severity—may vary greatly between countries, convergent adoption of environmental policies can be explained by countries' desire to orient their environmental policies to what is already being practiced in other countries. The rush by developing countries to sign multilateral environmental agreements, even when the problem the agreements address is of peripheral importance nationally, may be a further sign of this desire to appear as willing partners in the emerging global governance of the environment. This can be seen as peer pressure elevated to an international level.

That policy convergence is somewhat coerced rather than voluntary is harder to prove, as many countries want to put the best possible face on their adoption of new environmental policies. One form of quasi-coercion is regulatory competition (Busch, Jörgens, and Tews 2004): some countries seek to be the first to introduce or adapt regulatory policy in response to an emerging environmental concern, shaping the policy to their own domestic policy styles or other factors, thus avoiding more difficult adjustments later in the course of international or regional policy harmonization. Another source of coercion may be indirect pressure arising from trade negotiations, where countries with high environmental standards and relatively tough regulations may insist that their trade partners in the developing world adopt similar environmental policy approaches in order to prevent a "race to the bottom"—attracting industrial investment by lowering standards. International organizations, such as the multilateral development banks, also play a key coercive role by insisting on adoption of specific policy measures as part of the conditions for loans or under institutional capacity-building projects. Stone (2001) also points to the importance of non-state actors (think-tanks, research institutes, consultancy firms, non-governmental organizations, and others) as "policy entrepreneurs" (that is, using their influence over governments to promote "pet" policies) and the importance of information transfer through informal networks.

A probable lack of commitment to implementation and possible waste of official development assistance are particular concerns when coercion has been an important factor in adoption of a policy. Regardless of the source of coercion, adoption of policies without enforcement is meaningless unless new actors force governments to implement the policies they have already adopted (see Bell et al. 2004 on the role of the Supreme Court in India, which forced the government to implement its own pollution control policies).

The rate at which policy diffusion happens depends on many factors. According to Busch, Jörgens, and Tews (2004), these include the role of international organizations, the strength of opposition or other vested interests, the distribution of winners and losers, specific characteristics of the policy reform, and the common nature of the underlying problem across national borders. It is clear, however, that some new environmental policy instruments have spread very rapidly while others are only slowly being adopted—for example, about 140 countries have adopted environmental strategies (often based on Agenda 21) since the late 1980s, while only 13 have adopted energy/carbon taxes. All this suggests that if coercion is a dominant factor, it is not always effective.

2.1. Adoption of environmental policies

Adoption of new environmental policies may be due to incremental shifts, as old policies are found to be less effective for newly identified problems, or may be revolutionary, as fundamental paradigms shift regarding the relationship between humans and the environment. Caldwell (1996) notes that such a paradigm shift occurred some time before 1968, when the International Conference of Experts on a Scientific Basis for a Rational Use and Conservation of the Resources of the Biosphere was held in Paris. The final conference report stated that "…until this point in history the nations of the world have lacked considered, comprehensive policies for managing the environment," heralding the start of the new era of environmental policymaking. Jordan, Rüdinger, and Zito (2003) found that the adoption of new environmental policy instruments since the 1980s has been incremental rather than revolutionary, even though the number of such instruments being adopted is growing rapidly. Comparing different countries, they found that the drivers of these new policy instruments were dissatisfaction with existing regulations; the perceived superiority of the new environmental policy instruments; growing international competition and the need for more cost-efficient policies; growing domestic political support; and positive feedback interactions (where one policy has an unintended impact on another) between the policy instruments as a compatible policy mix is sought. They also identified the main barriers to adoption of innovative policies, which included lack of expertise and familiarity; opposition from vested interests; fears about loss of competitiveness; and distributional impacts (that is, having greater or lesser impacts on different groups of people).

2.2. Selecting the right environmental policies

Many factors can lead to flawed selection of innovative environmental policies. How, then, can policymakers increase their chances of success instead of blindly following forerunner countries? Few countries have adopted a formal and rigorous process of comparing policy alternatives (Swanson et al. 2004). Perhaps the best of those that exist is the UK's Regulatory Impact Assessment (RIA), introduced in 1998. RIA is a screening tool that examines the likely economic, social, and environmental impacts of a policy change, and where those impacts would fall. RIAs must be carried out on any policy change affecting any form of regulation, "whether European or domestic, which could affect the public or private sectors, charities, the voluntary sector or small businesses" (United Kingdom Cabinet Office 2005). All UK government policy proposals must meet five "principles of good regulation": they must be proportionate, accountable, consistent, transparent, and targeted. The options to be considered must include a do-nothing option and non-legislative options. Once a policy decision has been made, the

responsible minister must sign a final RIA stating that the "benefits justify the costs." The RIAs are detailed; for example, the RIA for the 2004 Energy Bill runs to 114 pages. In 2004 alone, the Department for Environment, Food and Rural Affairs submitted 24 such assessments. The UK's Environment Agency has begun work aimed at enhancing the RIA by incorporating additional consultation, specific guidance on social and environmental impacts, and formal risk assessment for residual risks after the policy has been decided (Environment Agency 2004). In 2004, Switzerland was developing a similar sustainability assessment procedure for projects and policies (Swanson et al. 2004; Swiss Federal Office for Spatial Development 2005), but according to Wachter (2005) there are no plans as yet to make it compulsory.

3. Research methodology for the RISPO case study analysis

3.1. Collection and documentation of the good practice case studies

Case study analysis is a form of qualitative research well suited to policy studies. It was thus fortunate that the present study was able to draw on a broad range of case studies from 17 countries, mostly in Asia and the Pacific (see table 1 in chapter 1 of this series, King and Mori 2007a) gathered as part of the RISPO project. RISPO was one of three sub-projects of the Asia-Pacific Environmental Innovation Strategy Project (APEIS). APEIS was funded by Japan as a type-2 partnership initiative at the World Summit on Sustainable Development in 2002. The partnership involved the Japanese Ministry of Environment in collaboration with 15 organizations in 9 countries.

Under the auspices of IGES's Long-term Perspective and Policy Integration Project, RISPO aimed to develop and maintain two knowledge-based tools, namely a Good Practices Inventory and Strategic Policy Options, in the expectation that policymakers in developing countries of Asia and the Pacific would find the experiences of other countries useful in drawing up their own policies when the need arose. To date, some 139 good practices and about 92 strategic policy options have been documented. In addition to the Good Practice Inventory, a further 160 best policy practices were collected by the same team in IGES from around the region under the Asia-Pacific Forum on Environment and Development (http://apfed-db.iges.or.jp/rstbpp.php) and it is intended that both databases will be merged in the future, linked with the United Nations Environment Programme environmental knowledge hub, and maintained as an evolving knowledge resource for the region.

One reason for focusing on the Asia-Pacific region was that most cross-case comparisons have been drawn from Europe and the USA, creating a gap in global coverage. More importantly, however, it was believed that there would be greater cultural and institutional similarities among neighboring developing countries in Asia and the Pacific, thus increasing the likelihood of an appropriate fit. The actual country coverage was largely determined by the participating organizations. These are listed in table 1.

Within APEIS, four trends at the cutting edge of environmental policy were considered most worthy of study: moving away from reliance on fossil fuels; material and energy efficiency in small and medium industries; sustainable urbanization; and the larger role of civil society in natural resource management. These were then further subdivided into eight subthemes. The trends and subthemes can be seen in table 2.

Table 1. Organizations participating in the Research on Innovative and Strategic Policy Options (RISPO)

Organization	Country
Bangladesh Resource Centre for Indigenous Knowledge (BARCIK)	Bangladesh
Energy Research Institute	China
University of Hong Kong	China
The Energy and Resources Institute (TERI)	India
Indonesian Ecotourism Network (INDECON)	Indonesia
Indonesian Institute for Forest and Environment (RMI)	Indonesia
Institute for Global Environmental Strategies	Japan
National Institute for Environmental Studies (NIES)	Japan
Management Association of the Philippines (MAP)	Philippines
Asian Institute of Technology (AIT)	Thailand
Kasetsart University	Thailand
Mahidol University	Thailand
Thailand Environment Institute (TEI)	Thailand
Vietnam National University	Vietnam
UNEP Risoe Centre on Energy, Climate and Sustainable Development (URC)	Denmark

The lead researchers in APEIS assigned the researchers from the collaborating institutions to find good policy practices within these environmental areas: climate change, air pollution, water resource management, ecosystem and biodiversity conservation, urban environment, rural environment, waste management, and forest conservation; and of critical policy instruments: regulatory, economic, institutional, partnerships, self-regulation, technologies, awareness/capacity building, and design, planning and management. The researchers were given some freedom to identify innovative good practices based on their experience, but were expected to follow general selection criteria. The cases should:

- lead to actual improvement in the environmental area considered or break new ground with non-traditional approaches;
- involve indicators for some visible or measurable change;
- demonstrate innovation (uniqueness of either the product or process) and replicability;
- be self-sustaining; and
- involve a range of actors through a participatory process.

It was not necessary that every case study selected should be excellent in all aspects, but each must have some good and noteworthy elements.

The researchers were provided with a data-collection protocol. They could use field assessments, interviews, media articles and other secondary materials, and other sources in a process of triangulation to obtain a clear picture of each case and identify its most important features. Besides basic facts such as location, participants, duration, and funding of the policy initiative, the basic format for documenting the good practices required them to collect information in the following categories for each case study:

Table 2. Environmental policy trends and subthemes for the RISPO good practice case studies

Policy trends	Subthemes
Accelerating the societal shift to a post-fossil fuel era.	Innovative finance for renewable energy development.
	Promotion of biomass energy use.
Finding material and energy-efficiency gains outside major industries.	Inter-boundary recycling market for promoting a resource-recycling society
	Improving environmental performance of small and medium enterprises
Orienting urban life to ecological principles.	Development of environmentally sustainable transport systems in urban areas
Retreat of "big" government and co-option of civil society into natural resource management.	Promoting environmental education by NGOs
	Facilitating protected-area management using community-based tourism
	Promoting sustainable resource management based on local/indigenous knowledge

- background
- objectives
- description of the initiative
- critical instruments
- impacts
- lessons learned
- potential for application elsewhere.

Each of the documented cases was quality checked by the IGES subtheme coordinator, and where necessary was sent back to the original researchers for revision. Finally, the approved case studies were entered into the RISPO Good Practices Inventory to make them accessible to the public.

3.2. Analysis of the case studies

Comparative policy research has a long and legitimate history (Dierkes, Weiler, and Antal 1987), which can be traced back to Aristotle and his comparative analysis of the constitutions of 128 city states that formed the basis of his famous treatise *Politics* (Deutsch 1987). Comparative policy research in the area of environment started in earnest in the early 1980s, following a sudden proliferation of new environmental agencies after the Stockholm Conference on the Human Environment in 1972. Writing in 1987, Vogel and Kun (1987) were only able to find 25 examples of comparative environmental policy studies, covering a limited number of countries. The analysis of the RISPO good environmental policy practices clearly belongs to the category of qualitative research and, within that, the case study approach. Research methodologies from this rich field of research were thus applied to the RISPO findings—possibly the first time such methodologies have been applied to environmental policy research in Asia and the Pacific. The methods were based on those suggested by Yin (2002).

The methodology was applied to four categories of dataset: the good practices within each of the eight subthemes; the good practices under each policy trend; the good practices from each country; and then the entire Good Practice Inventory. To focus the research, hypotheses were formulated at the policy trend and full database levels. The hypotheses for the full database study are given later in this paper. For the hypotheses for each policy trend, see the appropriate paper in this issue of *IRES*.

The first stage of analysis was to study the case studies in each dataset individually and look for interesting features that reflected on the hypotheses. A textual pattern-matching exercise was then carried out on the relevant case studies in each dataset. Finally, the results of the pattern matching and the individual case study reviews were analyzed together to shed light on the starting hypotheses. The studies at policy trend and subtheme level are described in chapters 4 to 7 of this linked series of papers. Chapter 8 presents findings and conclusions from the entire study, including the outcomes of the textual pattern matching country by country and for the entire Good Practice Inventory.

3.3. Classifying environmental policies

One of the first tasks of the analysis was to find a way of classifying the types of policy represented by the good practices. Much space has been devoted in the literature to alternative classifications or typologies of environmental policies, ranging from the simplistic notion of "carrots, sticks and sermons" to much more complicated systems (for example Jordan, Rüdinger, and Zito 2003; Roberts 2004; Sterner 2003). For RISPO, the following classification was used:

(a) *Regulatory instruments*, such as:

(i) Command and control: a regulatory regime where governments attempt to control those who would damage the environment in some way—typically employing rules, regulations, standards, policing, and compliance; and

(ii) Direct provision: governments use fiscal resources to invest directly in environmental infrastructure or other forms of environmental protection, often recouping the capital cost through user charges.

(b) *Economic instruments*, such as:

(iii) Market-based instruments: the power of the market is used to change the behavior of producers and consumers towards environmental protection—typically charges, taxes, tradable permits, and subsidies; and

(iv) Creation of new markets: governments attempt to overcome market flaws (or the absence of markets) by promoting new markets or property rights—typically financial incentives, assignment of property rights, quotas, green procurement, and seed funding.

(c) *Social instruments*, such as:

(v) Voluntary agreements: firms or industry associations enter into some form of voluntary agreement or code of practice designed to protect the environment; and

(vi) Informational regulation: information about environmental conditions or environmental performance is provided to the public so that they can take informed decisions on how to react.

3.4. Pattern matching

An important element in the case study research was textual pattern matching, based on the approach of King, Annandale, and Bailey 2000b. The aim of the exercise was to find common factors or combinations of factors; the most frequently occurring factors and combinations were assumed likely to be more important in the success of the good practices, and therefore worthy of consideration by policymakers embarking on new environmental policies.

The rival theory (Yin 2002) was that highly infrequent occurrence, or even complete absence, of the expected success factors would demonstrate that policymakers were not using the full range of decision tools and techniques available prior to deciding on a particular policy option or during implementation of specific policy instruments. Such omissions may raise concerns about the long-term sustainability of apparently good practices. Policymakers, therefore, should examine some of these less frequently observed factors and make sure that they are not overlooking valuable decision-assisting tools or processes. The research institutions proposing the good practices should also continue to monitor these cases and conduct follow-up evaluations to ensure that the final outcomes and impacts are consistent with initial predictions of success.

Each case study was coded for occurrences of 540 "success" factors (see Annex 1). Coding records were retained so that the coding could be matched with the relevant text extract for later verification. An independent sample was coded by a senior policy advisor in IGES to check the quality of coding and a minimum level of 80 percent matching was set. Some minor recoding was carried out as a result. Using linked Excel spreadsheets, the presence or absence of each variable was noted for the different cases in the dataset used in each part of the study, summed, and the frequency of each variable calculated (expressed as a percentage of the total cases in the relevant dataset).

3.5. Factors influencing success

Identification of "success" and "impeding" factors in the implementation of environmental policies was a core component of the King, Annandale, and Bailey (2000a, 2000b, 2003) study of integrated economic and environmental planning in Asia. The most important impeding factors they identified were (i) wrong choice of agencies; (ii) inadequate human resources and funding; (iii) lack of political support, (iv) inadequate stakeholder participation; (v) excessive effort on the planning product, detracting from implementation; (vi) inadequate understanding of the planning unit as an ecosystem; (vii) excessively narrow scenarios; (viii) inadequate project screening; (ix) poor vertical linkages between planning levels; (x) no agreed plan for monitoring and revision; and (xi) excessive delays between planning and implementation.

Similarly, an inter-country comparison of national strategies for sustainable development by Swanson et al. (2004) identified key common impeding factors, which included (i) lack of indicators to measure trade-offs and linkages or institutional mechanisms to provide feedback on progress; (ii) lack of

coordination between sustainable development strategies and national budgets; (iii) lack of vertical linkages to sub-national and local levels; and (iv) sub-optimal mixes of policy initiatives. Of 95 separate policy initiatives covered in the 19 case studies, almost half (43) were institutional initiatives, while only 16 were economic initiatives.

Table 3. Major coding of expected success variables for environmental policies and instruments used in the pattern-matching exercise

Actors	Processes	Content
Politicians	Preparation	Direct provision
Stakeholders	Formulation	Command and control
Institutions	Linkages	Market-based instruments
・organizations	Implementation	Voluntary agreements
・funding	Monitoring/revision	Informational regulation
・staff resources		Creation of new markets

For the present study, the list of factors believed likely to influence the success of an environmental policy were identified, based on a literature review (including the two studies mentioned above) and brainstorming within IGES. The variables were expressed in a list of 540 key terms or phrases that might appear in the good practice case studies. These 540 variables were roughly divided into three major groups: actor variables, process variables, and content variables. This was based on the assumption that success in innovative environmental policies and policy instruments could be attributable to the roles played by key actors, the care taken in the processes of the policy cycle (preparation, formulation, linking with other policies, implementation, monitoring, and revision), the appropriate choice of policy content, or, in most cases, a combination of all three. The subheadings in each of these three groupings are shown in table 3. The full list of expected success factors is given in the annex to this paper.

4. Hypotheses

Four overarching hypotheses were tested over the entire research, based on a basic understanding of the evolution and diffusion of environmental policy over the past 30–40 years obtained from the literature. These were:

Hypothesis 1: Innovative environmental policies emerged in response to increasing recognition of the interaction between environment and other sectors, but only as particular problems were identified and governments were pressured to react by concerned stakeholders.

Hypothesis 2: Although there has been relatively little innovation in the formulation of environmental policies in developing countries compared with the developed countries, they have shown much more innovation and diversity in policy implementation, reflecting particular national circumstances.

Hypothesis 3: Environmental policy innovation in developing countries of Asia and the Pacific, in the few cases where it has emerged, has built on unique cultural and social characteristics.

Hypothesis 4: Lack of a supportive policy framework and suitable market conditions act as impediments for policy innovation and adaptation.

Some other questions were raised by the case studies, but had inadequate data to answer them confidently:

Have innovative environmental policies been borrowed from other sectors, especially those sectors that intersect with environmental concerns?

Has the domain of modern environmental policy expanded so far that it could ultimately converge with, and be indistinguishable from, economic development policy?

Chapter 8 of this linked series of papers (King and Mori 2007c) attempts to address these hypotheses, drawing on textual pattern matching and on the findings in each of the four policy trend areas.

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Annex 1. Variables that could affect the success of environmental policies

Factors related to the actors involved

1. Political factors
   1.1 Political context
      1.1.1 Conducive
         1.1.1.1 Strong tradition of environmental policymaking
         1.1.1.2 Green political party
         1.1.1.3 Constitutional provision
      1.1.2 Not conducive
         1.1.2.1 Political squabbling
         1.1.2.2 North–South difference
         1.1.2.3 Imbalance between developed and developing countries' conditions
   1.2 Political support
      1.2.1 Maintained
         1.2.1.1 Cross-party
         1.2.1.2 Partisan
      1.2.2 Not maintained

2. Stakeholder factors
   2.1 Democratic traditions
      2.1.1 Political freedom to participate
         2.1.1.1 Academic freedom
         2.1.1.2 Media freedom
      2.1.2 Lack of political freedom to participate
         2.1.2.1 Poor democratic traditions
         2.1.2.2 No bottom-up planning
   2.2 Civic engagement and public participation
      2.2.1 Willingness to participate
         2.2.1.1 Future-oriented, participative communities
         2.2.1.2 Racial and/or religious similarities
         2.2.1.3 Private sector involved
         2.2.1.4 Industry associations involved
         2.2.1.5 Non-governmental organizations (NGOs) involved
         2.2.1.6 Formal public-private partnerships
         2.2.1.7 Networking
         2.2.1.8 Informal partnerships
         2.2.1.9 Multiple stakeholders
         2.2. 1.10 Media involved
      2.2.2 Lack of willingness to participate
         2.2.2.1 Economic interests threatened
         2.2.2.2 Other vested interests
   2.3 Conflicting groups
      2.3.1 Involved in policy processes
         2.3.1.1 Conflicting local groups convinced that policy is needed
         2.3.1.2 Careful selection of participants
      2.3.2 Not involved
         2.3.2.1 Transboundary conflicts
         2.3.2.2 Opposition from vested interests

- 2.4 Agreement on policies
  - 2.4.1 Negotiated
  - 2.4.2 Forced
  - 2.4.3 Open-ended
- 2.5 Conflicts and controversy
  - 2.5.1 Mediated
    - 2.5.1.1 Due to pressure from domestic interest groups
    - 2.5.1.2 Due to pressure from international groups
  - 2.5.2 Resolved
    - 2.5.2.1 Through courts
    - 2.5.2.2 Through informal agreements
  - 2.5.3 Public controversy continues
    - 2.5.3.1 Public controversy over losers and winners
    - 2.5.3.2 Public controversy over compensation
- 2.6 Cultural factors
  - 2.6.1 Confrontational
  - 2.6.2 Consensus-seeking
  - 2.6.3 Fatalistic

3. Institutional factors
- 3.1 Economic and environmental agencies
  - 3.1.1 Both involved
  - 3.1.2 One involved
    - 3.1.2.1 Only economic agencies involved
    - 3.1.2.2 Weak environmental agency
    - 3.1.2.3 Lack of transparency
  - 3.1.3 Neither involved
    - 3.1.3.1 Poor choice of responsible agency
    - 3.1.3.2 No agency responsible
    - 3.1.3.3 Lack of institutional incentives
    - 3.1.3.4 Lack of accountability
- 3.2 Sectoral agencies
  - 3.2.1Coordinated
    - 3.2.1.1 Integration with sectoral policy
    - 3.2.1.2 Internalization of policy
  - 3.2.2 Not coordinated
    - 3.2.2.1 Excessive bureaucracy
    - 3.2.2.2 Culture of expediency
    - 3.2.2.3 Agreement without commitment
    - 3.2.2.4 Lack of ownership
    - 3.2.2.5 Poor institutional arrangements for implementation
    - 3.2.2.6 Institutional conflicts
- 3.3 Sub-national/local government
  - 3.3.1 River basin commission/authority
  - 3.3.2 Protected area management agency
  - 3.3.3 Provincial/county/local government
    - 3.2.3.1 Local environmental agency
    - 3.2.3.2 Urban planning agency
    - 3.2.3.3 Municipal authority
    - 3.2.3.4 Public utility

- 3.4 Funding sources
  - 3.4.1 National government
    - 3.4.1.1 Policy formulation phase
      - 3.4.1.1.1Adequate
      - 3.4.1.1.2 Inadequate
    - 3.4.1.2 Implementation phase
      - 3.4.1.2.1 Adequate
      - 3.4.1.2.2 Inadequate
    - 3.4.1.3 Monitoring
      - 3.4.1.3.1 Adequate
      - 3.4.1.3.2Inadequate
    - 3.4.1.4 Policy revision
      - 3.4.1.4.1 Adequate
      - 3.4.1.4.2 Inadequate
  - 3.4.2 External sources
    - 3.4.2.1 Preparation of terms of reference
      - 3.4.2.1.1 Adequate
      - 3.4.2.1.2 Poor
    - 3.4.2.2 Implementation supervision
      - 3.4.2.2.1 Adequate
      - 3.4.2.2.2 Inadequate
    - 3.4.2.3 Follow-up
      - 3.4.2.3.1 Adequate
      - 3.4.2.3.2 Inadequate
  - 3.4.3 Local government involvement
    - 3.4.3.1 Policy formulation phase
    - 3.4.3.2 Institutional strengthening
    - 3.4.3.3 Implementation
    - 3.4.3.4 Monitoring and revision
  - 3.4.4 Private sector
    - 3.4.4.1 Illegal payments to bend rules
    - 3.4.4.2 Lobbying groups
    - 3.4.4.3 Commissioned research
    - 3.4.4.4 Voluntary co-funder
    - 3.4.4.5 Polluter pays
    - 3.4.4.6 Extended producer responsibility
    - 3.4.4.7 Donations/memberships/community funding
  - 3.4.5 Users
    - 3.4.5.1 Prepayment systems
    - 3.4.5.2 Tax payments
    - 3.4.5.3 Fees and charges
  - 3.4.6 Affordability analysis
    - 3.4.6.1 Funding sources for implementation of analysis
      - 3.4.6.1.1 Identified
      - 3.4.6.1.2 Not identified
    - 3.4.6.2 Major changes in government budgets
      - 3.4.6.2.1 Required
      - 3.4.6.2.2 Not required
    - 3.4.6.3 Funds available for implementation
      - 3.4.6.3.1 Adequate
      - 3.4.6.3.2 Inadequate

- 3.4.7 Willingness to pay for environmental quality
  - 3.4.7.1 Through cost-recovery mechanisms
  - 3.4.7.2 Unwilling to pay
- 3.4.8 Market mechanisms
  - 3.4.8.1 Tax concessions
  - 3.4.8.2 Economic sanctions
- 3.5 Staff involved
  - 3.5.1 Trained in environmental policy
    - 3.5.1.1 To an adequate level
    - 3.5.1.2 To an inadequate level
  - 3.5.2 Well equipped
  - 3.5.3 Willingness to work on implementation
    - 3.5.3.1 Willing
    - 3.5.3.2 Unwilling
      - 3.5.3.2.1 Because of competing commitments
      - 3.5.3.2.2 Because they genuine unwillingness to be involved
  - 3.5.4 Task force approach
    - 3.5.4.1 Willingness to share data
      - 3.5.4.1.1 Willing
      - 3.5.4.1.2 Unwilling
    - 3.5.4.2 Emergency task force
  - 3.5.5 Ability to communicate in English
    - 3.5.5.1 Able
    - 3.5.5.2 Translation required
  - 3.5.6 Emergence of champions
    - 3.5.6.1 Return of champions
    - 3.5.6.2 Loss of champions in implementation
  - 3.5.7 Incentive for staff
- 3.6 Consultants/researchers/think tanks
  - 3.6.1 Previous policy experience
    - 3.6.1.1 Credible and trusted
    - 3.6.1.2 Inadequate
  - 3.6.2 Guidelines or manual
    - 3.6.2.1 Available
    - 3.6.2.2 Not available
  - 3.6.3 Time allocated for analysis
    - 3.6.3.1 Adequate
    - 3.6.3.2 Inadequate
  - 3.6.4 Mix of skills
    - 3.6.4.1 Adequate
    - 3.6.4.2 Inadequate
  - 3.6.5 Independent policy advice to government on affordability
    - 3.6.5.1 Available
    - 3.6.5.2 Not available
  - 3.6.6 Terms of reference for policy drafting
    - 3.6.6.1 Clear
    - 3.6.6.2 Not clear
  - 3.6.7 Incentives and rewards
  - 3.6.8 Communication to policymakers
    - 3.6.8.1 Communication skills
    - 3.6.8.2 Communication tools

- 3.7 Local/regional NGOs and other civil society organizations (CSOs)
  - 3.7.1 Involved
    - 3.7.1.1 Local customary owners
    - 3.7.1.2 Interest group(s)
    - 3.7.1.3 Youth group(s)
  - 3.7.2 Capability strengthened
    - 3.7.2.1 By training/workshops
    - 3.7.2.2 By technical assistance
    - 3.7.2.3 By funding
  - 3.7.3 Division of responsibility
    - 3.7.3.1 Clear
    - 3.7.3.2 Unclear
- 3.8 Monitoring organization
  - 3.8.1 Mandated
  - 3.8.2 Adequately funded
- 3.9 Policy revision organization
  - 3.9.1 Mandated
  - 3.9.2 Adequately funded
  - 3.9.3 Not identified
- 3.10 Private sector/public corporation
  - 3.10.1 Environmental unit
  - 3.10.2 Board/management
  - 3.10.3 Operational unit
  - 3.10.4 Public relations
  - 3.10.5 Small and medium enterprise
    - 3.10.5.1 Capacity constraints
    - 3.10.5.2 Finance constraints
  - 3.10.6 Informal sector

Factors related to the policy processes

- 4. Policy formulation process
  - 4.1 Preparation phase
    - 4.1.1 Setting goals and objectives
      - 4.1.1.1 Based on research
      - 4.1.1.2 Based on public pressure
      - 4.1.1.3 Coerced by international pressure
      - 4.1.1.4 Based on strong political will
      - 4.1.1.5 To overcome difficulties of existing policies
    - 4.1.2 Scope
      - 4.1.2.1 Preparation in proportion to implementation
      - 4.1.2.2 Hierarchy of policies
        - 4.1.2.2.1 Clear
        - 4.1.2.2.2 Unclear
      - 4.1.2.3 Environmental coverage
        - 4.1.2.3.1 Comprehensive
        - 4.1.2.3.2 Restricted
      - 4.1.2.4 Policy boundaries
        - 4.1.2.4.1 Issue-based
        - 4.1.2.4.2 Spatial
        - 4.1.2.4.3 Sectoral

- 4.1.3 Terms of reference
  - 4.1.3.1 Developed by government
    - 4.1.3.1.1 Adequate
    - 4.1.3.1.2 Inadequate
  - 4.1.3.2 Developed by donor
  - 4.1.3.3 Developed by community/NGO
- 4.1.4 Source of policy innovation
  - 4.1.4.1 Experience of developing country/ies
  - 4.1.4.2 Experience of neighbouring country
  - 4.1.4.3 Experience of other developing country/ies
  - 4.1.4.4 Original innovation
    - 4.1.4.4.1 Through local trials
    - 4.1.4.4.2 From local champion
  - 4.1.4.5 Source not clear
- 4.2 Formulation phase
  - 4.2.1 Phasing
    - 4.2.1.1 One phase
    - 4.2.1.2 Two phases
    - 4.2.1.3 Multiple phases
  - 4.2.2 Policy analysis
    - 4.2.2.1 Analysis of conflicting policies
    - 4.2.2.3 Resistance to foreigners scrutinizing national policies
    - 4.2.2.4 Decision-making process
      - 4.2.2.4.1 Adequate
      - 4.2.2.4.2 Inadequate
    - 4.2.2.5 Transparency and flexibility
  - 4.2.3 Effectiveness of existing policies
    - 4.2.3.1 Baseline data
      - 4.2.3.1.1 Adequate current data
      - 4.2.3.1.2 Inadequate or obsolete data
      - 4.2.3.1.3 Repeatability of data gathering
      - 4.2.3.1.4 Excessive time
    - 4.2.3.2 Comparative assessment of experiences from other countries
      - 4.2.3.2.1 Developed countries
      - 4.2.3.2.2 Developing countries
    - 4.2.3.3 Indigenous/customary rules
    - 4.2.3.4 Policy impact assessment
  - 4.2.4 Models and scientific research
    - 4.2.4.1 Trend analysis
    - 4.2.4.2 Model development or adaptation
      - 4.2.4.2.1 Environmental models available
      - 4.2.4.2.2 Lack of reliable cause–effect models
      - 4.2.4.2.3 Reliability of computer models
    - 4.2.4.3 Predictions of future damage/losses
      - 4.2.4.3.1 Projections based on new data
      - 4.2.4.3.2 Projections based on published data
    - 4.2.4.4 Policy synthesis
      - 4.2.4.4.1 Adequate
      - 4.2.4.4.2 Inadequate
    - 4.2.4.5 Display of results
      - 4.2.4.5.1 Visual display
      - 4.2.4.5.2 Geographic information system applications
    - 4.2.4.6 Model integration

- 4.2.5 Scenarios
  - 4.2.5.1 Objectives, targets, and standards
    - 4.2.5.1.1 Measurable objectives
    - 4.2.5.1.2 Lack of measurable objectives
  - 4.2.5.2 Feasible development envelope
    - 4.2.5.2.1 Range of economic growth paths
    - 4.2.5.2.2 Fixed economic growth projections
  - 4.2.5.3 Social, environmental, natural resource, and economic dimensions
    - 4.2.5.3.1 Equal treatment of environmental and economic objectives
    - 4.2.5.3.2 Unbalanced treatment of any dimensions
  - 4.2.5.4 Preferred scenario
    - 4.2.5.4.1 Use of no-regrets strategies
    - 4.2.5.4.2 Precautionary principle
    - 4.2.5.4.3 Expenditure forecasts
    - 4.2.5.4.4 Cost/benefit analysis
  - 4.2.5.5 Visual display
- 4.2.6 Relationship to policies in other sectors
  - 4.2.6.1 Divergence
  - 4.2.6.2 Convergence
  - 4.2.6.3 Mainstreaming
  - 4.2.6.4 Optimum policy mix
- 4.2.7 Screening of policy impacts
  - 4.2.7.1 Economic assessment
    - 4.2.7.1.1 Environmental externalities internalized
    - 4.2.7.1.2 Economic and financial internal rates of return
    - 4.2.7.1.3 Cost/benefit ratios
  - 4.2.7.2 Cumulative environmental impact assessment
  - 4.2.7.3 Social impact/equity assessment
  - 4.2.7.4 Consideration of policy alternatives
    - 4.2.7.4.1 Adequate
    - 4.2.7.4.2 Inadequate
  - 4.2.7.5 Trade-offs
    - 4.2.7.5.1 Considered
    - 4.2.7.5.2 Not considered
  - 4.2.7.6 Policy prioritization
    - 4.2.7.6.1 Adequate
    - 4.2.7.6.2 Inadequate
  - 4.2.7.7 Implementability assessment
    - 4.2.7.7.1 Adequate
    - 4.2.7.7.2 Inadequate
    - 4.2.7.7.3 Not conducted
- 4.2.8 Policy documentation
  - 4.2.8.1 Legal document
    - 4.2.8.1.1 Available to the public
    - 4.2.8.1.2 Confidential
  - 4.2.8.2 In local language(s)
  - 4.2.8.3 In simple language
  - 4.2.8.4 Media campaign to disseminate
- 4.2.9 Technology assessment/development
  - 4.2.9.1 Technology new to this policy area
  - 4.2.9.2 Existing technology
  - 4.2.9.3 Best available technology
  - 4.2.9.4 Cleaner technology

- 4.2.9.5 Intellectual property rights/patents
- 4.2.10 Pilot testing
  - 4.2.10.1 Successful
  - 4.2.10.2 Unsuccessful

5. Linkages with other policy levels
- 5.1 Upwards national linkages
  - 5.1.1 To national economic development policies
    - 5.1.1.1 Linked
    - 5.1.1.2 Not linked
  - 5.1.2 To national sustainable development plan
    - 5.1.2.1 Linked
    - 5.1.2.2 Not linked
  - 5.1.3 To existing legislation
  - 5.1.4 To constitutional provisions
- 5.2 Downwards national linkages
  - 5.2.1 To local environmental policies
  - 5.2.2 To corporate policies
  - 5.2.3 To community rules/traditions
- 5.3 Linkages to other countries' or regions' policies
  - 5.3.1 To regional or sub-regional agreement or treaties
  - 5.3.2 Bilateral agreements
- 5.4 Linkages to multilateral environmental agreements
  - 5.4.1 Mandating national policies
  - 5.4.2 Aspirational
- 5.5 Linkages to global action plan/Agenda 21

6. Policy implementation
- 6.1 Immediate
  - 6.1.1 Action simultaneous with policy formulation process
  - 6.1.2 Immediately after policy decision
- 6.2 Medium term
  - 6.2.1 Delays due to approval process
  - 6.2.2 Delays due to budgeting
- 6.3 Long term
  - 6.3.1 Legal challenges
  - 6.3.2 Poor implementation arrangements
- 6.4 Compliance with policy
  - 6.4.1 self-regulation/self-determination
  - 6.4.2 Enforcement
    - 6.4.2.1 Public sector enforcement
      - 6.4.2.1.1 Adequate
      - 6.4.2.1.2 Inadequate
    - 6.4.2.2 Private sector enforcement
      - 6.4.2.2.1 Adequate
      - 6.4.2.2.2 Inadequate
  - 6.4.3 Support for compliance
- 6.5 Delays
  - 6.5.1 Maintaining momentum
  - 6.5.2 Delayed implementation

- 6.6 Ease of, and obstacles to, implementation
  - 6.6.1 No difficulty in implementation
  - 6.6.2 Difficult to implement
  - 6.6.3 Innovative solutions in implementation
  - 6.6.4 Technical support for implementation
    - 6.6.4.1 Capacity strengthening
    - 6.6.4.2 Awareness raising
    - 6.6.4.3 Outreach services
    - 6.6.4.4 Technical assistance
- 6.7 Level of implementation
  - 6.7.1 Village
  - 6.7.2 Watershed/ecosystem
  - 6.7.3 Urban area
  - 6.7.4 Sub-national
  - 6.7.5 National

7. Progress monitoring and policy revision
- 7.1 Monitoring and revision approach institutionalized
  - 7.1.1 Agency/ies mandated for monitoring and revision
    - 7.1.1.1 Monitoring agency
      - 7.1.1.1.1 Identified
      - 7.1.1.1.2 Not identified
    - 7.1.1.2 Policy revision agency
      - 7.1.1.2.1 Identified
      - 7.1.1.2.2 Not identified
  - 7.1.2 Human and financial resources for monitoring and revision
    - 7.1.2.1 Allocated
    - 7.1.2.2 Not allocated
  - 7.1.3 Self-monitoring
  - 7.1.4 Third-party monitoring
- 7.2 Monitoring of policy impacts
  - 7.2.1 Indicators
    - 7.2.1.1 Identified
    - 7.2.1.2 Not identified
  - 7.2.2 Environmental monitoring system and database
    - 7.2.2.1 Designed and implemented
    - 7.2.2.2 Designed but not implemented
    - 7.2.2.3 Not designed
  - 7.2.3 Impact and effectiveness monitoring system
    - 7.2.3.1 Adequate
    - 7.2.3.2 Inadequate
- 7.3 Evaluation and feedback
  - 7.3.1 Reporting and procedures
    - 7.3.1.1 Simple
    - 7.3.1.2 Complicated
  - 7.3.2 Independent review of policy impacts
    - 7.3.2.1 Implemented
    - 7.3.2.2 Not implemented
- 7.4 Policy revision
  - 7.4.1 Fallback position in case of unforeseen events
    - 7.4.1.1 Identified
    - 7.4.1.2 Not identified

7.4.2 Sunset clauses
7.4.2.1 Identified
7.4.2.2 Not identified
7.4.3 Review effectiveness of earlier policies
7.4.4 Comparative assessment
7.4.4.1 Quantitative
7.4.4.2 Qualitative

Factors related to the content of the policy

8. Policy content
8.1 Command-and-control type
8.1.1 Quantitative standards/objectives
8.1.1.1 Based on national research
8.1.1.2 Based on international research
8.1.1.3 No research basis
8.1.2 Qualitative standards/objectives
8.1.2.1 Based on national research
8.1.2.2 Based on international research
8.1.2.3 No research basis
8.1.3 No standards or objectives
8.1.4 Permits/restrictions
8.1.4.1 Mandatory environmental impact assessment
8.1.4.2 Licensing
8.1.4.3 Development permits
8.1.4.4 Permitting
8.1.4.4.1 Condition of entry
8.1.4.4.2 Condition of use
8.1.4.5 Banning
8.1.4.6 Quotas
8.1.4.7 Mandatory relocation
8.1.5 Incentives/disincentives
8.1.5.1 Sanctions
8.1.5.2 Financial incentives
8.1.5.3 Management responsibility
8.1.6 Monitoring and reporting
8.2 Market-based instruments
8.2.1 Aimed at producer behavior
8.2.1.1 Choice of raw materials
8.2.1.2 Choice of energy sources
8.2.1.3 Materials/energy efficiency
8.2.1.4 Recycling
8.2.1.5 Take-back schemes
8.2.1.6 Producer subsidies
8.2.1.7 Green procurement
8.2.2 Aimed at consumer behavior
8.2.2.1 Deposit refunds
8.2.2.2 Luxury tax
8.2.2.3 Carbon tax
8.2.2.4 Subsidies/cross-subsidy

- 8.2.3 Service industries
  - 8.2.3.1 Reduce inefficiency
  - 8.2.3.2 Tax concessions
  - 8.2.3.3 Maintenance services
- 8.3 Voluntary agreements
  - 8.3.1 Governments and producers
    - 8.3.1.1 Backed by legislation/enforcement
  - 8.3.2 Producer associations
    - 8.3.2.1 MNC and small and medium enterprise supply chain
    - 8.3.2.2 Industry association standards
  - 8.3.3 Producers and consumers
    - 8.3.3.1 Community agreements
  - 8.3.4 Unilateral agreement
    - 8.3.4.1 Corporate governance
    - 8.3.4.2 Corporate social responsibility
    - 8.3.4.3 Self-empowerment of communities
  - 8.3.5 Environmental management system
    - 8.3.5.1 ISO 14000 series
    - 8.3.5.2 EMAS
    - 8.3.5.3 ECO-ACTION 21
    - 8.3.5.4 Other EMS
- 8.4 Informational regulation
  - 8.4.1 Right of access to information
  - 8.4.2 Labelling and certification
  - 8.4.3 Environmental performance assessment
  - 8.4.4 Sustainability auditing/reporting
  - 8.4.5 Use of information technology
- 8.5 Direct intervention
  - 8.5.1 Public funding with full cost recovery
  - 8.5.2 Tax-funded infrastructure
  - 8.5.3 Build-own-transfer/buy-own-operate-transfer (BOT/BOOT)
  - 8.5.4 Decommissioning and removal
  - 8.5.5 Ecosystem rehabilitation/restoration
- 8.6 Creation of new markets
  - 8.6.1 Revised property rights
    - 8.6.1.1 Private parks
    - 8.6.1.2 Traditional ownership recognized
    - 8.6.1.3 Co-management
    - 8.6.1.4 Collective management
  - 8.6.2 Facilitating market creation
    - 8.6.2.1 Preferential treatment
    - 8.6.2.2 Seed funding
    - 8.6.2.3 Exclusive licensing
    - 8.6.2.4 Protected sector

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Best Practice on Environmental Policy in Asia and the Pacific: Chapter 4

Policies to Ease the Transition to a Post-Fossil Fuel Era

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The high cost of renewable energy technologies and uncompetitive prices of power from renewable sources under present market conditions are among the factors impeding a necessary shift away from fossil fuels. This research examines policy options that could help to overcome these obstacles, focusing on two driving factors: the policy framework and market conditions, and institutions that promote, support, and service developers and suppliers of renewable energy. It is based on analysis of case studies of successful environmental policies in the areas of promoting the use of biomass energy use and innovative financing for renewable energy development. In particular it looks at promotion of renewable power, both in areas connected to the power grid and those that are not. The case studies were collected by the project Research on Innovative and Strategic Policy Options (RISPO), which was led by the Institute for Global Environmental Strategies (IGES), Hayama, Japan. It is one of the series of eight linked papers in this special issue of the *International Review for Environmental Strategies* (*IRES*) describing a study to draw from the RISPO Good Practices Inventory useful lessons for environmental policymakers in developing countries.

Keywords: renewable energy, environmental policy, RISPO

1. Introduction

In 2000, 1.64 billion people, or around 27 percent of the world's population, did not have access to electricity. More than 99 percent of people without electricity were living in developing countries, and four out of five lived in rural areas. Many developing countries are now embarked on programmes to bring electrification to all such areas. At the same time, urban and industrial electricity use is also often rising. Energy use in Asia is fueled by rapid growth and dominated by fossil fuels. In 2004, total primary energy supply (TPES) for Asia was 3.1 billion tons of oil equivalent, representing about 25 percent of world total energy supply. TPES in the same region is projected to more than double to 6.2 billion toe (tones of oil equivalent) in 2030, due to expected drastic economic growth (Ito et al, 2006). Unless there is a significant change in electricity generation technologies, which today are almost exclusively based on fossil fuels, meeting the future energy demand will have major environmental impacts, especially contributions to climate change. It will also require huge investment. Governments

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around the world need to ease their countries' transitions away from reliance on fossil fuel, with as little economic, social, and environmental impact as possible.

For a large proportion of rural populations and for many poor urban communities, biomass in the form of firewood, charcoal, crop residues, and animal wastes is the main fuel used for cooking and heating. Some 92.5 percent of all the renewable energy consumed in developing countries of Asia comes from combustible biomass used as domestic fuel (IEA 2005a). Overall, renewable energy contributes 47.2 percent of the TPES in Asia in 2004 (IEA 2007). By comparison, in the same region, hydroelectricity accounts for 16.1 percent and geothermal, solar, wind, and tide power generation together a mere 3.6 percent (IEA 2007). Although most biomass fuel is used in traditional applications such as domestic woodstoves, the trend is for families to move up to more modern applications and energy sources—and directly or indirectly to electricity.

In the Bali Declaration on Asia-Pacific Perspectives on Energy and Sustainable Development, the member countries and associated members of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) stressed that "renewable energy sources, particularly through the increased use of modern technologies, could play a key role in enhancing energy supplies, particularly in the rural areas of the Asian and Pacific region. To that effect, we will strive to initiate policies and strategies to focus on and facilitate the optimal commercial exploitation of renewable energy resources," (ESCAP 2001). However, while renewables account for a significant share of TPES in Asia-Pacific, such modern technologies—including power generation—have hardly had any impact on local energy markets, and still remain peripheral in the total energy mix of most Asian countries.

The slow pace of penetration of renewable power has been attributed to a variety of internal and external, technical, institutional, and financial constraints (ESCAP 2001). These include the high initial costs of such technologies, geographical and seasonal variations in energy resources, insufficient energy market development, and a weak regulatory framework. The factors that influence success or failure in the development and implementation of renewable energy policies in developing countries are often different from those in industrialized countries, since specific characteristics at national and local levels play an important role in determining the barriers in each country (Wilkins 2002). This study focuses on lessons to help developing country policymakers to find policies that support modern renewable energy technologies in a way that is appropriate to their national situations.

2. Literature review: making renewable power more competive

From a review of the literature, two factors appear to be crucial to efforts to make renewable power more competitive in developing countries: the policy and market conditions under which renewable power has to compete against other sources of power, and the institutions available to provide financing, technical, and managerial support and services (IEA 2002b; Martinot et al. 2002; Vipradas 2001). Renewable energy competes in a market that is heavily biased in favor of fossil fuels. This is largely because the energy policy frameworks, laws, and systems built up over the last century were primarily designed with fossil fuels in mind (IEA 2002b). Current markets in energy services thus do not account for the value of environmental and social benefits associated with renewable energy—in fact, there is no

established market for the environmental benefits created by renewable energy (von Moltke, McKee, and Morgan 2004). As for any new technology, there are no well-established business models for renewable energy, much less information is available about renewable energy than about fossil fuels, and the public and investors are not yet familiar with it. Institutional infrastructure has not grown up to address these gaps, making cultural and social acceptance slow and leading to low demand and poor economies of scale. Renewable energy projects also have difficulty accessing credit and other financial instruments. However, some projects can access international financing—through intergovernmental organizations and bilateral cooperation, the relatively large amount of about US$500 million goes to developing countries each year as development assistance for renewable energy projects, training, and market support (REN21 2005).

2.1. Pricing and market conditions

Any intervention aimed at improving policy and market conditions in support of renewable energy needs to take into account contextual factors, notably whether the intention is to promote renewable energy in areas that are connected to the power grid or in areas that are not. In grid-connected areas, renewable energy faces an uphill struggle because of past state subsidies to support the establishment of the grid and the sunk costs of existing technologies such as coal and oil power generation. In off-grid areas, renewable energy may have the advantage, as the only, or the most appropriate, form of electrification. It may also provide opportunities for income generation and thus improve livelihoods and promote rural development (IEA 2002; UN Development Programme 2005; WorldWatch Institute 2006).

For grid-connected areas, a prime objective of policy intervention to promote renewable energy is to create a level playing field, neutralizing the unfair advantages enjoyed by existing technologies and so allowing renewable energy to compete more fairly with existing technologies (IEA 2002b). Appropriate policy instruments would include such policies as price setting and quantity forcing; cost reduction; public investment and market facilitation; and providing access for renewable energy producers to the power grid (Beck and Martinot 2004). In many cases, a mix of demand-pull and supply-push policies is applied in combination (Johansson and Turkenburg 2004). Renewable power feed-in laws—which give renewable power producers access to the grid with a guaranteed price for their power and specify a minimum amount of renewable energy that must be included in the portfolio of electricity resources of licenced electricity suppliers serving a state or country—have been adopted in several countries in Europe, Brazil, Japan, and many others (Johansson and Turkenburg 2004; Sawin 2004). Green procurement policies ensure that bulk purchases by government authorities or private businesses help to establish and strengthen markets for clean energy technologies (Geller 2003).

According to the Renewable Energy Policy Network for the 21st Century (REN21), at least 48 countries, including 14 developing countries, now have some sort of renewable energy promotion policy (REN21 2005). In these countries, it is common for targets to be set for renewable energy power production as a share of TPES, typically 5–30 percent over a decade, while mandates for blending biofuels into vehicle fuels have been enacted in at least 20 states and provinces worldwide as well as in three key countries: Brazil, China, and India.

Along with such policies that discriminate in favor of renewable power, creating a level playing field in energy markets also requires addressing the problem of so-called perverse subsidies to oil, coal, gas, and nuclear power (Pershing and Mackenzie 2004; IEA and UN Environment Programme 2002). Subsidies are usually provided by governments to reduce the unit cost of electricity and thus make it more affordable. In the countries of the Organisation for Economic Co-operation and Development (OECD), it is common for these subsidies to go to fossil fuel and nuclear power producers, whereas most of the subsidies in developing and transition economies go to consumers (von Moltke, McKee, and Morgan 2004). In China, the world's largest producer and consumer of coal, coal price reform, which started in 1996, together with a tax on high-sulfur coal to encourage a switch to natural gas and renewable energy, contributed to a 5 percent reduction in coal use between 1997 and 2001 (Brown 2003).

In non-grid-connected areas, policy and market interventions for renewable energy aim to create and develop new energy markets. Policies may include financial incentives to producers or consumers of renewable energy. Subsidies to support renewables are generally considered to be justified when the social or environmental gains exceed the economic cost of the subsidies (von Moltke, McKee, and Morgan 2004). While subsidies have proved their value in promoting renewable energy, international experience suggests that they are not a panacea. To be effective, argue Pershing and Mackenzie (2004), renewable energy subsidies should be well targeted, have a set end date (sunset provision), be predictable, be as direct as possible (close-to-market), and be provided through competitive mechanisms. In rural areas, subsidies have often been used to induce a shift from traditional biomass fuels like crop waste, dung, and wood—which have harmful environmental and health impacts—towards more efficient and cleaner fuels such as liquefied petroleum gas (LPG) and modern biofuels such as ethanol and methanol. Although modern fuels tend to be more costly—at least in monetary terms—than traditional fuels, they do provide people with greater opportunities for income generation (UN Development Programme 2005), such as electric lights allowing people to study or work at night.

Three types of policies have been applied in developing countries of Asia aimed at minimizing and optimizing the use of subsidies: (i) competitive approaches in the provision of subsidies, for example through bidding (IGES 2003a); (ii) financing models combining the provision of a subsidy with loan ownership (IGES 2004a); and (iii) public financial support that leads to long-term private investment and market growth (IGES 2003c). Successful examples of gradual reduction and removal of subsidies as economies of scale are achieved can be found in solar-powered homes programs in Japan (New Energy Foundation 2001), Australia (Australian Greenhouse Office, Department of the Environment and Heritage 2006), and some other countries (Martinot et al. 2002).

2.2. Supporting institutions

As noted above, there is generally very little established institutional infrastructure to support renewable energy. However, especially in rural areas of developing countries, the challenge of making modern energy available to the very poorest households is considered to be primarily the responsibility of governments (UN Development Programme, UN Department of Economic and Social Affairs, and World Energy Council 2000). Current commercial financial markets offer a wide range of financial

instruments, from credit to equity finance and bonds, but due to perceived risks make these available to renewable energy projects only under severely restrictive terms and conditions, if at all (Lindlein and Mostert 2005).

Although there remains a significant gap to fill, public- and private-sector institutions, consumer groups, non-governmental organizations (NGOs), and other institutions dedicated to renewable energy promotion are appearing worldwide. These provide financial, managerial, marketing, technical, and business development services (Martinot et al. 2002). The emergence of such institutions is an indication of a long-term commitment to renewable energy technologies and confidence in their economic, social, and market potential, in both the public and private sectors. Such a strategic orientation has helped countries such as Germany and Japan to take a leading role in the field of renewable energy (Mez 2004).

Public-sector institutions are at the forefront of renewable energy promotion, especially in developing countries with large populations that have no access to electricity. India's Department of Non-Conventional Energy Sources was set up in 1982 as the government's nodal agency for the promotion of non-conventional/renewable energy, and was upgraded to a ministry 10 years later. The establishment of the Ministry of Non-Conventional Energy Sources is perhaps the most far-reaching attempt to bring renewable energy into the heart of public institutional infrastructure. In 1987, the ministry set up the Indian Renewable Energy Development Agency Ltd (IREDA) as a concessionary financial institution to support the renewable energy sector. In Japan, the New Energy and Industrial Technology Development Organization (NEDO) was established in 1980 to develop new oil-alternative energy technologies. NEDO is Japan's largest public research and development management organization involved in new energy and energy conservation technologies, including solar-photovoltaic, solar thermal, wind, and other new energy technologies (NEDO 2005).

Renewable energy service companies (known as RESCOs) are private-sector organizations that provide services such as the sale, set-up, operation, maintenance, and repair of renewable energy systems, in addition to serving as financial intermediaries. The creation of renewable energy enterprises in developing countries is helping to hasten not only access to clean energy but the emergence of an indigenous chain of business and marketing services that will be crucial for the long-term viability of new energy technologies.

Several civil society organizations (CSOs), including consumer groups, now operate in the area of renewable energy promotion. Consumer-driven demand for environmentally friendly power is stimulating the development of renewable energy. Over 4.5 million consumers in Australia, Canada, Europe, Japan, and the United States purchased renewable electricity retail or via certificates in 2004, indicating that there is a viable market (REN21 2005). Microfinance institutions that provide small-scale lending to rural consumers for the purchase of energy devices such as solar lanterns, solar home lighting systems, and solar cookers now operate in some of the world's poorest regions (Global Development Research Centre 2006).

Much of the institutional development achieved at the national level in developing countries has been supported by a range of international mechanisms involving the UN Development Programme (UNDP),

the UN Environment Programme (UNEP), the World Bank, and regional development institutions. The Global Environment Facility, the largest source of funds for renewable energy in the developing world, has supported initiatives to address problems such as inadequate policy frameworks, inadequate financing and business support, and lack of technical capacity (Global Environment Facility 2005). Through programmes such as the Rural Energy Enterprise Development (REED) initiative, UNEP has supported the creation of dozens of RESCOs providing clean energy technologies and services in rural areas and semi-peripheral urban areas in Brazil, China, and some African countries (UN Environment Programme and UN Foundation 2002, 2003).

3. Approach and methods

3.1. Research question and hypotheses

The central research question that this strand of research sought to answer was what policies will hasten the adoption of renewable energy technologies in developing countries, and so ease the transition to a post-fossil fuel era, without major social disruption or environmental harm.

The primary starting hypothesis was that an ideal set of policies to ease the transition to a post-fossil-fuel era in developing countries would hasten the widespread adoption of renewable energy by effectively helping to remove national barriers to the competitiveness of renewable energy with fossil fuels.

This hypothesis implies three propositions covering the main internal barriers to widespread adoption of renewable energy in Asia and the Pacific:

Hypothesis 1: Policies that help to create a level playing field in energy markets for renewable energy to compete with fossil fuels will hasten the widespread adoption of renewable energy.

Hypothesis 2: The creation of public and private institutions that provide increased financial and technical support will promote development and marketing of renewable energy and thus help to hasten its widespread adoption.

Hypothesis 3: In developing countries, the initial focus of policies should be on promoting renewable energy in non-grid-connected areas.

3.2. Methodology

This study looked at good practice case studies in two of the RISPO subthemes: innovative finance for renewable energy development, and promoting biomass energy use. Both topics were considered to be at the cutting edge of policy development in the area of renewable energy and, therefore, more likely to contain innovative policies that could promote renewable energy and make it more competitive with fossil fuels.

The research was conducted in two stages. First a review was made of the available literature to understand the background and produce a conceptual framework for analysis. Next, the selected case studies were analyzed both through individual reading of each study and a textual pattern-matching technique. This latter method centred on 540 “success factors”—factors believed likely to affect the success of environmental policies—which were identified by the RISPO researchers based on the

literature review. Appearances of these factors in the case studies were counted in order to identify patterns. It was assumed that those factors that occurred in a large proportion of the case studies were more likely to be important for the success of the policy. A full description of the methodology used in the study can be found in chapter 3 of this linked series of papers (King and Mori 2007). More information about the case studies examined in each subtheme can be found in table 1. All case studies can be found in the RISPO Good Practices Inventory (http://www.iges.or.jp/APEIS/RISPO/inventory/db/index.html).

The biomass energy promotion good practices covered a variety of related policy areas, including technology development, information-based capacity development, and financial support. The good practices in the area of innovative financing included combinations of government and community financing in India; market development for solar lanterns in the post-subsidy regime in India; the first Clean Development Mechanism project in renewable energy in China; and funding of rural electrification through international competitive tender in China.

Table 1. Details of the case studies used in the study on policies for accelerating the societal shift to a post-fossil fuel era

Subtheme	Case studies	Countries	Partner institutes
Innovative finance for renewable energy development	17	China, India	Energy Research Institute (China), Energy and Resources Institute (India)
Promoting biomass energy use	11	India, Thailand	Energy and Resources Institute (India), Thailand Environmental Institute, National Centre for Genetic Engineering and Biotechnology (Thailand), National Institute for Environmental Studies (Japan)

4. Findings

4.1. Policies to make renewable energy affordable

All countries included in this study have developed new policies specifically to create market conditions favorable to renewable energy. These policies have proved effective in enabling renewable energy projects to attract investment, increasing their share in energy markets, and increasing affordability. Each has sought to bring electrification to rural areas that currently are not connected to the national power grid (off-grid areas). Rural electrification programs in China and India have involved large amounts of public spending in support of producers and consumers of renewable energy-based power.

Table 2. Frequency of occurrence of financing variables, as percentages of all case studies

Variables	IFRED cases (n = 17) (%)	BIEPS cases (n = 11) (%)	Total IFRED + BIEPS (n = 28) (%)	All cases in the Good Practice Inventory (n = 139) (%)
3.4 Funding	100	64	86	68
3.4.1 National government	47	36	43	27
3.4.2 External sources	47	0	29	28
3.4.3 Local government involvement	47	18	36	22
3.4.4 Private sector	41	36	39	35
3.4.5 Users pay	76	9	50	21

Note: IFRED = innovative financing for renewable energy development; BIEPS = biomass energy promotion.

Table 3. Frequency of occurrence of policy content variables, as percentages of all case studies

Variables	IFRED cases (n = 17) (%)	BIEPS cases (n = 11) (%)	Total IFRED + BIEPS (n = 28) (%)	All cases in the Good Practice Inventory (n = 139) (%)
8. Policy Content	100	73	89	75
8.1 Command and Control	35	36	36	32
8.1.5 Incentives/disincentives	35	36	36	18
8.2 Market-based instruments	94	64	82	44
8.2.1 Aimed at producer behavior	65	27	50	30
8.2.1.2 Choice of energy sources	6	27	14	5
8.2.1.6 Producer subsidies	6	36	18	5
8.2.1.7 Green procurement	0	27	11	6
8.2.2 Aimed at consumer behavior	35	9	25	7
8.2.2.4 Subsidies/Cross subsidy	12	9	11	2
8.6 Creations of new markets	53	18	39	29
8.6.2 Facilitating market creation	35	18	29	12
8.6.2.1 Preferential treatment	12	0	7	2
8.6.2.2 Seed funding	18	9	14	3

Note: IFRED = innovative financing for renewable energy development; BIEPS = biomass energy promotion.

The case studies included successful uses of innovative financing models for the promotion of renewable energy, especially in off-grid areas, combining funding from the public sector, the private sector, and end users. While public spending remains important (a factor in 43 percent of the cases studies), private-sector finance also makes a significant contribution (39 percent of cases). Perhaps most surprisingly, the frequency of user payment appearing as a factor (50 percent) is a strong indication that even poor consumers are willing to pay for reliable products and services when flexible financing terms are provided (table 2).

The case studies also indicate that public financial support for purchase of renewable energy technologies early on can contribute significantly to creating a market for renewable energy. In China's western province of Inner Mongolia, subsidies were provided towards purchase of small wind turbines between 1986 and 1999, with the aim of developing the market. The state contributed US$60 towards the cost of 300-watt wind turbine systems in 1986, and the subsidy amount was gradually reduced to reach US$25 in 1999. By the time the policy was terminated in 2000, a local small wind turbine industry had appeared where there had previously been none. Inner Mongolia became the largest market for small wind turbines in the world and accounted for over 90 percent or 150,000 units of small wind turbines produced and installed in China by the end of 2000 (IGES 2003b).

A policy of public investment in renewable energy promotion at the national level in China in the 1970s and 1980s was similarly successful. Public funding of research, application, and expansion of household methane tank biogas generators and mini-hydropower technologies led to installation of 10 million household methane tanks, with an annual output of 3 billion cubic meters of methane, and installation of 28.5 GW of mini-hydropower by the end of 2002, making China the world leader in the design, construction, management, and equipment manufacturing of these technologies (IGES 2004c).

In many parts of India where agriculture has long relied on diesel-powered water pumps, the central government and local energy-development agencies have committed large amounts of public funding to inducing a shift among local people towards pumps running on solar photovoltaic power. In the state of Punjab, such programs have now achieved economies of scale, reducing the price of pumps by 25 percent in two years and significantly reducing public spending while at the same time attracting private financial institutions to provide consumer loans (IGES 2004a).

Another approach used successfully in India has been a gradual shift from capital subsidy to interest subsidy, thereby combining subsidy schemes with mainstream financing and user contributions. This has resulted in gradual replacement of government funds with private-sector funds; increased availability of public funds; and delivery of subsidy programs with lending by private financial institutions. In the commercialization of solar thermal technologies, the approach led to a doubling of the market for solar water heating of systems and doubling of the number of manufacturers, from 40 to 80, over a period of four years (IGES 2004b).

In India's West Bengal state, a market for solar photovoltaic mini-grids has been stimulated through a combination of the central subsidy for renewable energy, state-level subsidy, and local-area development funds in the ratio of 70:20:10. In addition, each consumer invests about US$45 towards application fees for receiving the connection and internal wiring. The monthly fixed tariff is about US$2.50 for consuming 18–20 kilowatt hours of electricity (IGES 2003c).

4.2. Market creation

Policy initiatives aimed at creating and maintaining markets for renewable energy have been taken (and documented) in most of the countries from which case studies were drawn (table 3). These initiatives have aimed to create a more level playing field for renewable energy. Mechanisms that guarantee a particular price of access to a given share of the market and targets to achieve specified amounts a energy generation

from renewables are common policy instruments. The analysis indicates that market-based instruments – such as performance based incentives (occurring in 82 percent of the case studies) and the creation of new markets (39 percent) are given greater emphasis than other instruments.

Table 4. Frequency of occurrence of actor variables, as percentages of all case studies

Variables	IFRED cases (n = 17) (%)	BIEPS cases (n = 11) (%)	Total IFRED + BIEPS (n = 28) (%)	All cases in the Good Practice Inventory (n = 139) (%)
2.Stakeholders	100	82	93	77
2.2 Civic engagement and public partnership	100	82	93	75
2.2.1.3 Private sector involvement	94	45	75	30
2.2.1.9 Multiple stakeholders	76	45	64	37
3. Institutional factors	100	100	100	91
3.1 Government economic and environmental agencies	65	9	43	14
3.1.1 Both involved	12	9	11	4
3.2 Sectoral agencies	6	27	14	19
3.3 Sub-national/local government	65	9	43	25
3.6 Consultants/researchers/think tanks	35	18	29	30
3.7 Local/regional civil society organizations and non-governmental organizations	24	0	14	35

Note: IFRED = innovative financing for renewable energy development; BIEPS = biomass energy promotion.

Table 5. Frequency of occurrence of factors related to level and location of implementation, as percentages of all case studies

Variables	IFRED cases (n = 17) (%)	BIEPS cases (n = 11) (%)	Total IFRED + BIEPS (n = 28) (%)	All cases in the Good Practice Inventory (n = 139) (%)
6.7 Location of implementation	100	100	100	53
6.7.1 Village level	18	45	29	18
6.7.2 Watershed/ecosystem level	0	9	4	2
6.7.3 Urban level	12	27	18	22
6.7.4 Sub-national level	88	9	57	12
6.7.5 National level	0	9	4	4

Note: IFRED = innovative financing for renewable energy development; BIEPS = biomass energy promotion.

In particular, market-based instruments that aim to change the behavior of producers and consumers seem to have been very successful. Seed funds and preferential treatment for industries have proved important for creating renewable energy markets. Market mechanisms feature prominently as instruments for attracting private-sector investment.

In China, a policy to introduce competitive tender for supply of village solar power systems resulted in about 25 percent reduction in price, from about US$20 per watt peak in 2002, prior to implementation

of the policy, to less than US$13 per watt peak in 2003. Over 70 percent of Chinese townships without access to the power grid are now expected to use competitive tender in their bids to become electrified (IGES 2003a). The findings demonstrate that bidding and other competitive market approaches in the provision of subsidies are an effective way of providing public support to renewable energy projects at the least cost to taxpayers. Given the large number of villages still without access to power, financial support from the government will almost certainly be necessary for another five to ten years.

In Japan, a renewable portfolio standard system was adopted as part of a new energy policy implemented partly under the 2003 Special Measures Law Concerning the Use of New Energy by Electric Utilities. The new energy policy sets a target of 3 percent for the share of new and renewable energy in national TPES by the year 2010. The Japanese renewable portfolio standard system requires 1.35 percent of each retail supplier's electricity sales in 2010 to come from renewable energy, generated by solar, wind, biomass, geothermal, or small hydropower (Japan Agency for Natural Resources and Energy 2005).

In February 2005, the Chinese government promulgated the Renewable Energy Law, which came into force on January 1, 2006. The law encourages the construction of renewable energy power facilities and requires power grid operators to purchase resources from registered renewable energy producers. It aims to boost China's renewable energy capacity by 2020 and outlines a commitment to invest US$180 billion in renewable energy over this period (WorldWatch Institute 2006).

The Indian government aims to increase the share of renewable energy in the country's installed power generation capacity by an additional 10,000 MW by 2012. One of the major application areas is the electrification of 18,000 remote villages. The Ministry of Power aims to complete electrification of all villages by 2012 using local renewable energy sources and decentralized technologies. The 2003 Electricity Act empowers state electricity regulators to promote renewable energy and to specify a percentage of the total consumption of electricity that each distribution licensee should aim to purchase from renewable energy sources (Chaurey, Gueye, and Babu 2003).

4.3. Supporting institutions

The promotion of renewable energy brings into play a wide range of public and private actors and institutions (table 4). These include central, local and provincial government bodies; multilateral development and financial institutions; private-sector institutions, including financial institutions, marketing and distribution companies, and energy service companies; and civil society organizations such as NGOs and consumer groups.

Most renewable energy promotion projects are commissioned by central governments, often through their main economic or environmental agency. In 43 percent of the case studies, the economic agency or the environmental agency was involved. However, there are the enormous differences between IFRED and BIEPS in terms of actor variables. Only 18 percent of BIEPS projects had involvement of central environmental and/or economic agencies, while 65 percent of IFRED project involved those agencies. In fact, sectoral agencies played a much bigger role that environmental and economic agencies in BIEPS, i.e. technology and policy development related to biomass energy.

Rarely were both the economic and environmental agencies part of the process (11 percent). There was little indication of coordination with, or involvement of, sectoral agencies in the policy formulation process (14 percent). Parallel to central and national government agencies, sub-national institutions featured fairly prominently (43 percent). The role of policies at the sub-national and village levels was evidently important in implementing rural electrification programs employing decentralized renewable energy sources (table 5). The case studies indicated a frequency of 57 percent at the sub-national level, including 29 percent at village level, against only 4 percent of cases under national-level implementation.

The private sector and civil society have been pioneers in the transition to alternative energies. Private-sector institutions (appearing in 75 percent of cases), including financial institutions, manufacturers, generators, distributors, and energy service companies, have made technological, financing, and marketing contributions to the development of renewable energy. In many cases, the private sector has intervened through obtaining concessions under contracts concluded with central or local governments. There are many examples of private-sector institutions, particularly energy service companies, providing the whole repair and maintenance infrastructure for renewable energy installations, especially in rural areas. Dozens of RESCOs have been set up to provide sale and installation and maintenance services for household solar photovoltaic systems in China and in India, as well as solar water heating in India.

Advocacy by civil society organizations, especially NGOs, has brought renewable energy to the centre of energy policy and political debates. The number of cases involving multiple stakeholders (64 percent) in both BIEPS and IFRED reveals the the importance of diverse actors which are involved in renewable energy projects, comparing to other projects. The involvement of civil society organizations, however, is relatively low when it comes to policy implementation (14 percent). Comparatively, consultants, researchers, and think-tanks have more significant involvement (29 percent), especially in conducting feasibility studies for the introduction of new energy technologies, as some of the cases indicate.

The findings reflect a general trend towards public-private partnerships in developing and implementing renewable energy projects, already demonstrated by many successful examples of public-sector and private-sector institutions dedicated to the promotion of renewable energy. In the Indian state of Tamil Nadu, the Indian Renewable Energy Development Agency (IREDA) has supported policies of the Tamil Nadu State Electricity Board to promote renewable energy in attracting private-sector investment in grid-connected wind farms. Along with various other fiscal and financial incentives offered by central and local governments, financing from IREDA—covering up to 70 percent of project costs or 75 percent of the cost of the wind energy generation equipment—has helped in achieving installation of 210 grid-connected wind-powered electricity generators producing a total of 475 megawatts in Tamil Nadu alone—22 percent of the wind power projects it has financed in the whole of India. The cumulative installed capacity of wind power generators in Tamil Nadu was 895 megawatt hours as of September 2002, representing more than half of India's installed capacity in the wind sector. IREDA has also financed wind power projects in other states—Maharashtra, Andhra Pradesh, and Gujarat—with similar success, stimulating the private sector and other financing institutions to participate in the wind power sector (IGES 2003d).

In the states of Karnataka, Kerala, and Andhra Pradesh, SELCO-India, a solar energy service company operating in southern India since 1995, provides services ranging from solar lighting and electricity to

clean water, wireless communications, and consumer financing. SELCO-India's business model involves partnering with local financial and microfinance institutions, local solar entrepreneurs, and technicians, and using re-financing from IREDA (at 2.5 percent per annum), through a World Bank lending program, to enable consumers to borrow at affordable rates. Consumers are offered a lease-to-own scheme wherein they pay one-quarter of the system cost upfront and take a loan for the rest at a priority-sector lending rate of 12.5 percent per annum. This approach has proved successful in responding to consumers' willingness to pay for better lighting services with staggered payment (IGES 2002).

Consortia have developed in various sectors and tend to remove technological and financial constraints to the development of markets for renewable energy, especially biomass energy. In Japan, entrepreneurs with insufficient finance and knowledge have worked with business partners and end users in a collective and complementary manner and successfully developed technology innovations that not only meet local needs but can also compete in the existing energy market (IGES 2006).

In very low-income communities, microfinance institutions have often been the most affordable source of loans for securing clean energy devices such as solar lanterns. In Bangladesh, the Grameen Bank has been able to extend microfinance to some 2 million borrowers, 95 percent of whom are women. In India, the Chandrakanti project in Karimnagar and Khammam districts of Andhra Pradesh had succeeded in marketing 10,000 solar lanterns to self-help groups by March 2003 through micro-credit schemes. Similar institutions are running successful programs in more than 50 countries (IGES 2005).

5. Conclusions

The findings of the case study analysis strongly support the three starting hypotheses. These are discussed below.

Hypothesis 1: Policies that help to create a level playing field in energy markets for renewable energy to compete with fossil fuels will hasten the widespread adoption of renewable energy.

The findings confirm that transforming the policy and market conditions in the energy sector is a critical element in accelerating the adoption of renewable energy and thus in facilitating the transition to a post-fossil fuel era. The cases reviewed illustrate that policies creating a more level playing field for renewables to compete with conventional energy sources can be effective in enhancing the competitiveness of renewable energy technologies. Strategies to create such a level playing field in off-grid areas have included increasing the amount of government support to renewable energy. In grid-connected areas, policies have tended to focus on altering market conditions to makes renewable energy projects more viable, largely through subsidies, incentives, and mechanisms guaranteeing renewable energy a fair price and/or access to a market. The findings confirm that a renewable energy policy with clear targets help to induce prompt actions by energy users to mitigate environmental problems by adopting renewable energy.

Hypothesis 2: The creation of public and private institutions that provide increased financial and technical support will promote development and marketing of renewable energy and thus help to hasten its widespread adoption.

The findings confirm that a wide range of actors are involved in promoting and supporting alternative energy technologies. Civil society organizations have been important advocates in structuring the policy and political debate on finding alternatives to fossil fuels. Government institutions have taken the lead at the stage of policy formulation and implementation. Sub-national institutions have played a prominent role especially when new forms of energy have been introduced as part of rural electrification programs. Provincial and local governments have been key actors in policy implementation at sub-national level. The private sector and consumers have been important in the policy implementation phase, especially when renewable energy technologies have reached the stage of commercialisation. Thus, the promotion of renewable alternatives to fossil fuels involves a complex process of interaction among a variety of actors.

Hypothesis 3: In developing countries, the initial focus of policies should be on promoting renewable energy in non-grid-connected areas.

The study indicates that directly adopting renewable energy technologies, rather than first going through a stage of using conventional energy, is a prior issue possible in off-grid areas of developing countries, but subsidies might be needed for some time until economic development makes these energy sources locally affordable as well as capacity development for appropriate practices. In grid-connected areas, renewable energy faces an uphill struggle because of past state subsidies to support the establishment of the power grid and the sunk costs of existing technologies. In off-grid areas, renewable energy has an advantage in that it does not necessarily require a large grid infrastructure to be built based upon decentralized energy system. Even if the cost per unit of energy output were exactly the same for renewable and non-renewable energy technologies (output from renewables is currently more expensive) it would make sense for a national renewable energy policy to target off-grid areas first, in particular for rural electrification. In markets where renewables are uncompetitive and do not have special advantages, such as urban areas, policies should aim at leveling the playing field on which renewables compete with conventional energy over the medium term; it appears that developing institutions that can support renewable energy development—financing, technical, and marketing organizations—may be an appropriate priority in such areas. Over time, as economies of scale and technological developments bring down the unit costs of renewable energy, and the cost of conventional energy goes up, renewable energy will become more competitive in grid-connected areas and the costs to the state of maintaining a level playing field will go down, hopefully to the point where subsidies can be removed from both renewable and non-renewable energy, appropriately applying the related sunset provisions. However, there is a need to examine the likely consequences of promoting renewable energy in non-grid-connected areas for the economy as a whole and more attention and economic priority need to be given to grid area.

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Best Practice on Environmental Policy in Asia and the Pacific: Chapter 5

Policies for Material and Energy Efficiency Gains in Small and Medium Enterprises

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Resource efficiency and recycling and strategies for sustainable production and consumption need to be further developed throughout Asia. To improve resource efficiency the small and medium enterprises (SMEs) that occupy a majority of industrial sectors and contribute a large proportion of Asian gross domestic product must become central actors. This research reviews the role of SMEs in Asia in connection with resource efficiency improvement, and provides insights into why governments need to work with the private sector and local communities to make further advances in resource efficiency. A pattern-matching analysis of 43 examples of good practice from 11 countries reveals a range of factors that are common to success. These include: good supply-chain linkages; industry clusters; producer associations; voluntary agreements through public-private partnerships; good technical support; and the underlying threat of increased regulation if voluntary approaches fail. This paper is part of the series of eight linked papers presented in this special issue of the *International Review for Environmental Strategies* (*IRES*).

Keywords: environmental policy, small and medium enterprises, SMEs, resource efficiency, energy efficiency

1. Introduction

Asian economic growth, building on rapid industrialization, has increased the region's economic output by four times in the past 20 years. Land, water, energy, and other resources have been exploited at an unprecedented pace. Despite such growth, the region still contains the majority of the world's poor, and economic growth and resource utilization remain unavoidable priorities, especially in developing countries. How can the region sustain its fast-growing economy while minimizing the pressure on remaining natural resources (WorldWatch Institute 2006)?

Production and consumption patterns in Asia are undeniably unsustainable (Asian Development Bank 2005). Export-oriented production with low resource efficiency coupled with mass domestic consumption accelerates the linear throughput of resources rather than closing production and consumption loops, and generates massive amounts of waste. Improvement of resource efficiency is a vital strategy in correcting this unsustainable pattern. Resource efficiency (also called eco-efficiency) is a management strategy based on input/ output measures, that seeks to maximize resource productivity in

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order to reduce pollution or waste per unit of output, and to generate cost savings and competitive advantages (Organization for Economic Co-operation and Development 1997). Resource efficiency can be achieved through means such as material substitution and sourcing, design for the environment, cleaner technologies, process waste minimization and recycling, and reduced packaging and transport (ACTETSME 2003).

Small and medium enterprises (SMEs) play a key role in Asia's socio-economy, accounting for more than 90 percent of manufacturing industry (ACTETSME 2003), with a 60–70 percent share of domestic production (Asian Institute of Technology 2002). The contribution of SMEs to Asia's gross domestic product is somewhere between 30 and 60 percent (Hall 1995). In Indonesia, 99.9 percent of all registered companies are categorized as SMEs, employing more than 80 percent of the workforce (Guerin 2002). Hence resource efficiency in the region cannot be achieved without a major contribution by SMEs.

2. Literature review

2.1. Resource efficiency concepts

a. Industrial ecology

The concept of industrial ecology grew out of the idea of "industrial metabolism"—the flow of materials through the industrial system and into the environment—mimicking ecological processes in nature. By analogy with natural ecosystems, industry can be viewed as a collection of industrial organisms organized into a network through which energy and (used and reused) materials flow, and from which come products and services (Bringezu 2003). Minimizing physical exchanges with the environment and establishing "internal material loops" (the re-using of materials within the factory) that are driven by renewable energy flows are essential to a sustainable industrial metabolism (Allenby and Richards 1994). Recycling of materials; "cascaded use" (the extraction of more value out of the same material as it cascades through the production process); and increased energy efficiency are major components of a sustainable industrial metabolism (Graedel and Allenby 1995).

b. Cleaner production

In the 1990s, cleaner production was promoted by various United Nations and other organizations. The basic proposition was that better and cleaner production processes would not only save resources and reduce waste, but would also be more profitable—a win-win solution. Thus, cleaner production means reducing environmental impacts from processes, products and services by using better management strategies, methods and tools (Angel and Rock 2000). Related terms include *green business*, *sustainable business*, *eco-efficiency*, and *waste minimization*.

c. Factor X

Factor X is an efficiency concept that has been applied to reduction in resource use, where X refers to a value ranging between 4 and 50 (Hofftren 2001). Lower values of X relate to short-term environmental improvement. Thus, a factor X of four, advocated by von Weizsacker, Lovins, and Lovins (1997) targets doubling wealth while halving resource consumption resulting in a fourfold

increase in resource efficiency over the next 20–30 years. The factor 10 concept (Schmidt-Bleek 1993) argues that even a tenfold increase of resource efficiency is technically feasible over the next 30–50 years (Bleischwitz and Hennicke 2004; Hofftren 2001). Others have argued that for the developing world to enjoy a standard of living similar to that of the US and Europe, efficiency improvements by a factor of 50 will be needed (Welford 2005).

d. Other concepts

Other concepts used in connection with resource efficiency include: *dematerialization* (using less physical resources and embedded energy per unit of output) (Herman et al. 1990); *design for the environment* (the integration of resource minimization and recycling potential into product design) (Lewis and Gertsakis 2001); *cradle-to-cradle resource management* (ensuring that waste materials become inputs for subsequent production processes) (McDonough and Braungart 2002); and *natural capitalism* (learning from nature to design production and consumption systems) (Hawken, Lovins, and Lovins 1999).

2.2. Resource efficiency and SMEs in developing countries

Different nations, and sometimes different ministries within the same nation, often have their own definitions of what an SME is. This makes it difficult to gauge the performance of SMEs in terms of resource efficiency despite the fact that significant numbers of SMEs have emerged in the reuse and recycling sector during the past 10 years. A higher market demand for used or recycled products exists in developing countries than in the developed world because low-income groups, which form the majority of the population, cannot afford expensive new products. Thus, both the supply and demand sides of economies in developing countries provide a suitable environment for expanding reuse and recycling markets. Expansion of recycling businesses in developing countries also leads to improved social benefits through creation of jobs for the poor and the consequent improvement of their living standards (Porter 2002).

In Asia, the recycling market has grown beyond local and national borders (O'Neill 2000). Trade flows of recyclables have increased rapidly between Asian countries over the past decade (Hashi and Mori 2005), and one of biggest driving forces behind this increase is the high demand from China for material resources, including recyclables. This demand offers tremendous opportunities to other countries in Asia for trading in recyclables (Takada and Okumura 2003). In response, an increasing number of SMEs trading in recyclables have emerged in the region (Wang 2005), and the potential size of the market is estimated at over US$300 billion per year (Asian Development Bank 2005).

In spite of increased concerns over scarcity of resources and waste management, national policies for resource use have not been established in most developing countries in Asia (Takada and Okumura 2003). It is not clear if this is because of the absence of national policies or not, but local people, communities, and the informal sector (for example scavengers) currently engage in collecting, sorting, refashioning, and remanufacturing recyclables from local waste streams without support from municipalities (Imura and Regina 2004).

Resource efficiency matches the interests of SMEs in terms of cost concerns and competitiveness in the market (JICA 2001). Small changes in a business's operations, which often do not require a huge investment, can significantly reduce resource use. For instance, a checklist of environmental

performance for Eco Action 21 (a Japanese environmental management program especially designed for SMEs) advocates simple activities such as "double-side paper use for photocopies", and "reduction of packing/wrapping materials for shipment by reusing them". (Ministry of Environment, Japan 2001).

2.3. The cluster approach and resource efficiency

Because of their weak technical capacities and financial vulnerability, SMEs may be better served in some instances by taking collective action. With this in mind, the cluster approach was designed to strengthen the competitive advantage of SMEs by building up local capabilities through support for a broad range of actors (from SME owners and associations to policymakers at local level), and addressing the problems of knowledge fragmentation and lack of coordination and joint action. The fact that a large number of homogeneous industries often locate in a concentrated area means that the provision of technical assistance to individual SMEs is efficient and effective, and also facilitates the spread of good practice, since the needs of the SMEs in a cluster are quite similar (UNIDO 2000). Moreover, networking among SME clusters can lead to other benefits, such as the provision of venues to discuss solutions to shared problems, and the pooling of resources to jointly improve resource efficiency and competitiveness (Nadvi 1995).

While the cluster approach involves horizontal interaction among SMEs, compared to the vertical interaction of supply chains, a central facilitator is necessary in both cases. An industrial association or local authority can facilitate networking of multiple stakeholders associated with industrial clusters. In the Netherlands, SMEs identified municipalities and employers' associations as the organizations they consulted the most when they needed information about waste and emissions management (Hoevenagel and Wolters 2000). As SMEs generally have strong ties to local communities, initiatives and support from local authorities are often critical to the improvement of SMEs' environmental performance. (Martinuzzi et al. 2000).

2.4. Supply chain contributions to resource efficiency

As globalization has become pervasive, the private sector has been shifting its approach to environmental performance from compliance with regulations and standards to the more voluntary approach of corporate social responsibility (CSR). Zadek and Evans (1997) argue that three main drivers of CSR are values, strategy, and public pressure. Whatever motivations lie behind the adoption of CSR practices, companies often find financial benefits through improved efficiency in energy and resource use triggered by CSR concerns.

Although CSR is generally associated with transnational corporations, SMEs have increasingly been encompassed in this global trend through supply chains. Most SMEs use local resources and do business in domestic markets, so relatively few of them are engaged in export-related activities. Yet these few contribute to 75–80 percent of export earnings, more than half of which come from subcontracts and ancillary supplies (Asian Institute of Technology 2002). Thus, SME manufacturing is influenced strongly by the global market through supply chain relationships and, as customers, transnational corporations concerned with their reputation are demanding that SMEs improve environmental management in their production processes (Adversario 2000).

To meet these expectations, SMEs are required to invest in new product design, upgrade technology to minimize the use of energy and materials in production processes, and undertake other housekeeping improvements, all of which impose an extra financial burden (Chiu 2000). Considering the financial and technical constraints on SMEs, however, transnational corporations reciprocate by arranging technical support like training programs, technology transfers, and information sharing (Angel and Rock 2000). SMEs, in turn, have high expectations that such a collaborative process in dealing with environmental issues along the supply chain will result in mutually profitable outcomes (Business for Social Responsibility Education Fund 2001).

2.5. Policies and regulatory arrangements to promote resource efficiency

Formulating appropriate policy for industrial ecology or cleaner production systems requires careful analysis of material flows on different levels and at various scales to understand the entire picture of the industrial metabolism in each sector (Bringezu 2003). In the policy formulation process, a holistic approach that considers the closely intertwined relationships between environmental, social, and economic issues is essential, particularly in developing countries (Ramaswasmy 2003). In the policy implementation process, creating new organizational structures for industrial systems and utilizing partnerships between industrial players may be needed. Through such structures, not only closed material loops (zero waste) should be created but also closed liability loops, where responsibility for all materials and waste remains within the industry (Stahel 2003).

Government policies can provide the incentive structure to encourage adoption of cleaner production, but to reduce the throughput of material in a specific company, internal paradigm shifts are needed so that managers can focus on the root causes of the burden their industry places on the environment. Management and employees need constantly to think of ways to decouple economic success from resource throughput. One possible paradigm shift is to aim for a service economy rather than an "ownership" economy, in which results are measured by resource stocks and their sustainable use instead of by resource flows (Giarini and Stahel 1989, 1993; Stahel 2003).

Despite extensive research, incorporation of the findings of industrial ecology research into public policy is in its infancy. Major reasons include: a missing link between research and concrete political targets; a lack of monitoring instruments; and insufficient attention to the linkage between material flows and economic factors (Bringezu 2003). End-of-pipe or top-of-smokestack command-and-control measures have dominated the environmental policy field for a long time, so the more holistic thinking on industrial ecology will take some time to penetrate the world view of environmental policymakers.

While voluntary initiatives between the private sector and communities create regional and global benefits in terms of resource conservation, government policies and measures are needed for effective implementation of resource efficiency strategies. One study identified five drivers of eco-efficiency: (i) institutional support measures and incentives; (ii) regulatory severity and disposal costs; (iii) cost of energy and materials; (iv) public pressure and awareness; and (v) company policy and market pressures (ACTETSME 2003). Although all drivers are important, regulatory arrangements may provide the strongest back-up for resource efficiency strategies, as is illustrated by Japanese legislation. The Law for Promotion of Utilization of Recyclable Resources (1991) increased industrial material recovery rates from

38 percent in 1990 to 42 percent in 1998 (OECD 2002). While innovation-friendly regulations can improve resource productivity and competitiveness, the problem lies in persuading small industries to cooperate and to adopt resource efficiency as a continuous goal (D'Souza 2001).

Most countries in the region have environmental laws and regulations, but nearly all fail in enforcement. Due to their fragmented nature, large number, and poor mobility from one location to another, it is difficult for enforcement agencies to monitor the regulatory compliance of SMEs (ACTETSME 2003). "Environmental legislation in India, although seemingly as tough as that in major developed nations, is not well enforced. Though multinationals and the large domestic companies are monitored, poorly funded regulatory bodies find it nearly impossible to police the millions of small- and medium-scale units" (D'Souza 2001). Thus, improved regulatory arrangements for SMEs with ensured enforcement are key to further resource efficiency.

Table 1. Details of the case studies used in the study on industrial material and energy efficiency

Subtheme	Case studies	Countries	Partner institutes
Inter-boundary recycling market for promoting resource-recycling society	23	Brazil, Germany, Japan, Malaysia, Philippines, South Korea, Taiwan, Thailand, United Kingdom, Viet Nam	Management Association of the Philippines, Thailand Environment Institute
Improving environmental performance of small and medium enterprises	20	India, the Philippines, Thailand	The Energy and Resources Institute, Thailand Environment Institute

Table 2. Categories in the 540 "success" factors for environmental policies and policy instruments

Actors and Institutions	Processes	Content
Stakeholders	Preparation	Command and control
Institutions	Formulation	Market–based Instruments
Agencies	Linkages	Voluntary agreement
Funding	Implementation	Creation of new markets
	Monitoring/revision	

3. Approach and methodology

3.1. Central research question and hypotheses

From a review of the literature the following research question arises: in developing countries of Asia, what policies will most effectively promote increased resource efficiency in SMEs?

The following hypotheses address the central research question:

Hypothesis 1: To date, the private sector and local communities have led attempts at industrial resource efficiency more effectively than government policy.

Hypothesis 2: In order to formulate comprehensive policies for resource efficiency in developing countries, existing industrial markets and networks (including vertical and horizontal SME networks) do not need to be changed in any major way.

Hypothesis 3: Voluntary instruments through partnerships and networks, supported by consolidated government command and control policy, are most effective in bringing about greater resource efficiency.

3.2. Methodology

a. Collection of data

Case study analysis as a form of qualitative research has been used to verify the three hypotheses. Under two subthemes in the Research on Innovative and Strategic Policy Options (RISPO) program ("inter-boundary recycling market for enhancing resource-recycling society" and "improving environmental performance of small and medium-sized enterprises"), 43 cases of good practice were gathered, mainly from developing countries in Asia, in collaboration with several research institutes in the region (table 1). Additional cases from other countries, like Japan, are also examined from the literature.

The following research protocol was set to find innovative "good practice" cases in the two subthemes. Each case should (i) lead to actual improvement in the environmental area considered, or break new ground in non-traditional approaches; (ii) involve indicators for some visible or measurable change; (iii) demonstrate an innovative (uniqueness of either the product or process) and replicable approach; (iv) be self-sustaining; and (v) involve a range of actors through a participatory process.

Based on these conditions, the cases were collected and written up according to a standard format, which included the following items: background; objectives; description of the activity; critical instruments; impacts; lessons learned; and potential for application. The critical instruments in each case were identified by selecting from a list that included the following categories: regulatory, economic, institutional, partnerships, self-regulation, technologies, awareness/capacity building, and design, planning and management. All the case studies are maintained in an ongoing database by the Institute for Global Environmental Strategies (IGES).

b. Methodology for analysis

A textual pattern-matching analysis based on the approach of King, Annandale and Bailey (2000a, 2000b, 2003) as outlined by Yin (2002) was used to identify "success" factors in the 43 cases. Following a literature review, the pattern-matching analysis was carried out on the case studies in the RISPO Good Practices Inventory in the areas of improving the environmental performance of SMEs and promoting inter-boundary recycling markets for fostering a resource-recycling society. Each case study was coded for occurrences of each of the 540 factors expected to influence the success of the environmental policy, which were in the categories shown in table 2. The frequency of occurrence of each of the factors across the case studies was calculated. The results of this analysis were compared with the actual content of the case studies in order to draw lessons and identify patterns. A more detailed

description of the analytical methodology can be found in chapter 3 of this linked series of papers (King and Mori 2007).

Table 3. Frequency of occurrence of actor and context variables, as percentages of all case studies

Variables	Inter-boundary recycling market (n = 23) (%)	Environmental performance of SMEs (n = 20) (%)	All case studies (n = 43) (%)	All cases in the Good Practice Inventory (n = 139) (%)
2.2 Civic engagement and public participation	74	80	74	77
2.2.1 Willingness to participate	61	80	70	75
2.2.1.3 Private sector involvement	22	35	28	30
2.2.1.4 Industry Associations	0	40	19	12
2.2.1.6 Formal public-private partnerships	13	45	28	24
2.2.1.7 Networking	35	60	47	33
2.2.1.9 Multiple stakeholders	22	0	12	37

Table 4. Frequency of occurrence of institutional variables, as percentages of all case studies

Variables	Inter-boundary recycling market (n = 23) (%)	Environmental performance of SMEs (n = 20) (%)	All case studies (n = 43) (%)	All cases in the Good Practice Inventory (n = 139) (%)
3.3 Sub-national and national government	13	0	7	25
3.3.3 Provincial/county/local government	13	0	7	23
3.4 Funding	17	100	56	68
3.4.1 National government	13	45	28	27
3.4.3 Local government involvement	13	0	7	22
3.4.4 Private sector	35	45	40	35
3.7 Local/regional CSOs and NGOs	30	5	19	35
3.10 Private sector/public corporation	39	80	58	36
3.10.5 Small and medium enterprise	13	60	35	17
3.10.5.1 Capacity constraints	13	60	35	13

The presence or absence of each possible explanatory variable (outlined in the good practice summaries included in the RISPO on-line database) was noted for all 43 cases using linked Excel spreadsheets, where the frequency of occurrence was calculated. Coding records were retained to show the relevant text extract used to match the coding words, so that the results could be independently verified. Observations were drawn from the frequency analysis regarding the most common explanatory variables, across all cases, across countries, and across subthemes.

4. Findings

4.1. Key players

The "actor" variables include relevant stakeholders and institutional factors. Most cases (over 80 percent) showed one or more actors as important in the successful outcomes (table 3), indicating that the social context is an essential factor to consider when trying to improve resource efficiency and introduce related technologies. The high frequency of "civic engagement and public participation" (74 percent of cases) suggests that successful cases of resource efficiency in the region have been mainly led by non-government entities (such as local communities and industry associations). The almost equally high occurrence of "willingness to participate" (70 percent) shows that motivated companies, communities, and individuals have been successful in improving resource efficiency without a heavy hand from regulatory agencies.

While industry associations were not actively involved in all cases (19 percent), in the case of small-scale pipe-fitting units in the state of Punjab in India, local industry associations played a catalytic role in cooperation with the regulatory agency, the Punjab Pollution Control Board, leading to a 20 percent reduction of furnace-oil use. Also, the Thai Tanning Industry Association operates two treatment plants serving 130 tanneries, and reduced discharge of chromium to less than 0.6 milligram per liter from previous levels of up to 4,000 mg per liter.

The frequent occurrence of "networking" (47 percent) and "formal public-private partnerships" (28 percent) shown in table 3 reveals that resource efficiency improvement has been carried out through networks or partnerships (that is, collective action) rather than through individual actors. When focused toward a common objective, it seems that the range of different assets, expertise, and viewpoints that networks and partnerships offer vigorously promotes technological adaptation and information flows, which in turn contribute to resource efficiency (B-LIFE 1998). Often partnerships involve external donors joining with local non-governmental organizations (NGOs) and industry associations, such as the cases involving small-scale foundries and brick kilns in India.

Table 4 shows that funding by the private sector (40 percent) is more frequent than by national government (28 percent), so the low frequency of involvement by economic and environmental agencies (7 percent) and sub-national/local government (7 percent), showing a limited role of governments, is not surprising. However, there are indications that greater involvement of governments in developing appropriate policies and providing seed funding could accelerate the adoption of resource efficiency measures. In one case in the Philippines, the national Environmental Management Bureau established the Industrial Waste Exchange Program but later transferred the program to a non-profit organization established by business executives, admitting the comparative advantage of private sector leadership and participation during implementation.

One surprise was that the pattern matching did not reveal a significant role for provincial or local government (7 percent). One case from outside Asia, in Brazil, was successful largely because of the involvement of the city municipality, which created a partnership with waste pickers and provided financial support to the project. Currently municipalities and local governments in developing countries

in Asia appear not to recognize their potential roles in promoting resource efficiency activities (or their mandates might be too limited), despite the trend towards decentralization. The literature review also pointed out the lack of capacity of local governments in environmental management, and this finding underlines the need to strengthen this capacity. Taking into consideration non-Asian case studies such as the United

Table 5. Frequency of occurrence of policy process variables relating to the policy formulation phase, as percentages of all case studies

Variables	Inter-boundary recycling market (n = 23) (%)	Environmental performance of SMEs (n = 20) (%)	All case studies (n = 43) (%)	All cases in the Good Practice Inventory (n = 139) (%)
4. Policy formulation process	74	95	84	78
4.1 Preparation phase	26	95	58	50
4.1.4 Source of policy innovation	17	20	19	4
4.2 Formulation phase	57	95	74	65
4.2.6 Intersection with other sector policies	48	0	26	14
4.2.7 Screening of policy impact	0	70	33	21
4.2.9 Technology assessment/development	22	45	33	19
4.2.9.4 Cleaner technology	13	35	23	10
4.2.10 Pilot testing	26	20	23	15

Table 6. Frequency of occurrence of policy process variables relating to the policy implementation phase, as percentages of all case studies

Variables	Inter-boundary recycling market (n = 23) (%)	Environmental performance of SMEs (n = 20) (%)	All case studies (n = 43) (%)	All cases in the Good Practice Inventory (n = 139) (%)
6. Policy implementation	87	90	88	80
6.6 Ease of implementation	30	85	79	47
6.6.3 Innovative solutions in implementation	0	0	0	7
6.6.4 Technical support for implementation	70	85	77	41
6.6.4.1 Capacity strengthening	35	35	35	24
6.6.4.2 Awareness raising	61	45	53	33
6.6.4.3 Outreach services	0	25	12	7
6.6.4.4 Technical assistance	26	25	26	10

Kingdom's London Remade and the case of Belo Horizonte City in Brazil, where the role of local government has been important, local governments in Asia could learn from their counterparts in other regions.

The self-reliance of SME entrepreneurs often pushes them to be actively involved in financing their own resource efficiency practices (35 percent). One case from Malaysia focusing on small-scale plastic recycling exemplifies a common pattern of development of SMEs in the recycling business. The company, with just 14 employees, started operating in waste collection and transportation and later, using its advantageous position it saw the potential of the market, expanded into the plastic and rubber recycling business. The company now processes up to 180 tonnes of material per month and exports to China, India, and Thailand. Because SMEs are characteristically entrepreneurial and highly mobile, with the capacity for quick decision making, they are in a good position to read market trends and start new business lines that can capitalize on previously neglected resource efficiency opportunities. However, their capacity constraints (35 percent) often hinder further efficiency in resource use and technical support from other actors, including governments, is therefore essential to help them grow.

4.2. Strengthening support rather than innovation

a. Formulation phase

One would expect that all phases of the policy process, from preparation to review and revision, would be equally represented in successful cases (tables 5 and 6). In fact, policy formulation (84 percent) and policy implementation (88 percent) dominate. In the policy formulation process, the formulation phase (74 percent) had a higher frequency than the preparation phase (58 percent). This could indicate that insufficient time and effort is taken to conduct the necessary investigation before embarking on policy decisions. Under the formulation phase factors, however, screening of policy impacts (33 percent) and technology assessment/development (33 percent) rate fairly highly—both factors that suggest careful weighing of options before proceeding. In addition, intersection with other policies (26 percent), and pilot testing (23 percent) rate quite highly, suggestive of a step-by-step process in policy formulation. Nevertheless, it is clear that additional attention to screening, pilot testing, and impact assessment during policy formulation would increase the chances of success, particularly where policies are copied from other jurisdictions.

Most of the cases from India show a strong dependence on technological solutions, while "cleaner technology" (23 percent) was less prevalent in Thailand. Except for a small number of cases, technologies to facilitate cleaner production are readily available in India because it has a large number of engineering experts. One case in India, "Achieving cleaner production and improved productivity in stone crushing units" is a typical example of adapting a simple design, which is not as costly as more sophisticated technologies borrowed from industrialized countries. Thus, more attention should be paid in policy formulation to supporting locally available technologies and sharing them as widely as possible. Also, South–South cooperation should be promoted, such as in the case where vertical-shaft brick-kiln technology was transferred from rural China to India.

b. Implementation phase

The significance of pragmatism in the policy implementation phase can be illustrated by the gap between "innovative solutions in implementation" (0 percent) and "ease of implementation" (79 percent) in table 6. Generally, innovative or new ideas are not needed in carrying out resource efficiency improvements. Rather "capacity strengthening" (35 percent), "awareness raising" (53 percent), and

"technical assistance" (26 percent) have greater value. Indeed, 26 out of the 43 cases identified capacity building and awareness raising as critical instruments for success. For example, a private consulting firm provided employees of an elevator manufacturing company in Thailand in-house training on operational procedures, including an awareness-raising program on environmental management systems, and the company was soon certified ISO 14001.

Table 7. Frequency of occurrence of policy content variables, as percentages of all case studies

Variables	Inter-boundary recycling market (n = 23) (%)	Environmental performance of SMEs (n = 20) (%)	All case studies (n = 43) (%)	All cases in the Good Practice Inventory (n = 139) (%)
8. Policy content	91	80	86	78
8.1 Command-and-control	35	45	40	34
8.2 Market-based instruments	70	30	51	49
8.2.1 Aimed at producer behavior	70	30	51	32
8.2.1.3 Materials/energy efficiency	52	20	37	13
8.2.1.4 Recycling	52	0	28	10
8.3 Voluntary agreements	70	35	53	30
8.3.2 Producer associations	30	5	19	6
8.3.5 Environmental management system	35	30	33	11
8.6 Creation of new markets	52	0	28	29

With little support expected from governments, SMEs often find NGOs reliable partners for technical support (77 percent) in the implementation of resource efficiency. The Society for Environment and Human Development (a Bangladeshi NGO) worked with a small tannery with 30 unskilled workers in Bangladesh and succeeded in recycling solid wastes as well as minimizing use of water and chemicals (Asia Foundation). The NGO-Business Environmental Partnership Program funded by USAID through the Asia Foundation was also actively involved in several other cases resulting in waste minimization, as well as cost and time savings.

5. Policy content: voluntary approaches with government support

The most striking detail in table 7 is the high frequency of the policy instruments "voluntary agreements" (53 percent) and "market-based instruments" (51 percent). One interpretation is that environmental policies for SMEs in developing countries of Asia have not yet matured, thus voluntary initiatives are filling a gap between the demand for resource efficiency and the supply of government policy measures. However, the significant frequency of command-and-control policies (40 percent) suggests that regulatory arrangements underpin or back up voluntary resource efficiency initiatives by non-government sectors. In most cases, it appears that the combined effort of government regulation, non-government and private sector voluntary agreements, and market incentives yields the greatest success.

The case of cleaner technologies in the small-scale glass industry in India provides an example of how effective combined policy instruments can be. To protect the Taj Mahal (a world heritage site) from pollution, local glass industry SMEs in Firozabad were directed by the Supreme Court to choose between conversion from coal to natural gas, relocation, or closure. Combined efforts by the Supreme Court, voluntary agreements by industry, technical support from overseas, clustering of SMEs, and enforcement of regulations will result in a 55 percent energy saving for each converted coal-fired pot furnace, and once all 800 furnaces in Firozabad are converted significantly cleaner air should result.

Resource efficiency in Japan is also supported by regulatory arrangements. The country is well advanced in the development of new technologies and voluntary actions are broadly practiced, so there is a tendency to rely heavily on technological solutions for energy saving and recycling. Nevertheless, central and local governments have been introducing innovative legislation to promote voluntary initiatives (IGES 2005).

6. Conclusions

Most governments in developing countries have yet to introduce a comprehensive set of policies for promoting resource efficiency. Where governments have begun to examine relevant policy options, many have resorted to borrowing proven policies from developed countries. On the other hand, there are relatively mature economic markets for energy and resource saving in developing countries driven by innovative companies (including SMEs) in the private sector, as well as community initiatives. However, this often occurs in a policy vacuum, and where there are policies in place there tends to be a lack of effective enforcement. Such voluntary activities have been driven not by top-down political intervention but rather by bottom-up economic rationality.

The market for recyclable materials in developing countries has been based on existing networks. SMEs in developing countries create networks vertically as well as horizontally to ensure efficient flows of information and goods. The creation of clusters of SMEs in related industries has been promoted to stimulate synergy and create horizontal networks for complementary activities. With regard to vertical networks, supply chains that include SMEs have been formed as a result of globalization, usually with a multinational company as the key link in the chain. Both horizontal and vertical networks work well for resource efficiency and are complementary.

In addition, local initiatives such as community-based collection and separation of waste are also essential activities in improving resource efficiency in developing countries and provide an important source of income for the poor. However, social concerns, such as possible exploitation and the health problems of scavengers (e.g. exposure to toxic chemicals and injury) should be taken into account when forming policy. While the role of scavenging in waste collection and separation is an important part of resource efficiency, exposure to toxic materials and injury are constant hazards for scavengers. While modernizing waste collection systems may not be an immediate option in developing countries, government measures to tackle such social issues are needed.

The case study analysis demonstrates the rather passive role of consumers in relation to resource efficiency. Companies consistently state that their production output is always guided by consumer

sovereignty: if consumers want products that require lower levels of resource input then companies will find ways of satisfying their demands. Therefore, an important role that governments should play is to ensure that consumers are given adequate information about the resource intensity of the products they buy, for example through energy rating systems and product labeling.

The analysis appears to confirm the first hypothesis, that resource efficiency measures are being led by the private sector and local community initiatives. However, there is ample room for greater efforts to improve the policy environment for resource efficiency and recycling. Asian governments interested in introducing new resource efficiency and recycling legislation and regulations would do well to examine the example of Japan in this area. Governments could also become more involved through the direct provision of industrial parks that are designed and built based on industrial ecology concepts; through green procurement that gives preference to recycled materials; by facilitating the shift away from a consumption-based economy to a service-based economy; and by providing better information to consumers.

In relation to the second hypothesis (in order to formulate comprehensive policies for resource efficiency in developing countries, existing industrial markets and networks do not need to be changed in any major way), there is plenty of evidence that developing countries have relied on such arrangements to date. However, this may reflect the absence of government policy and political commitment, or poor enforcement, rather than being the best way to formulate comprehensive policy for resource efficiency in developing countries. As there is considerable room for governments to become more involved in policy formulation and implementation in this domain, as the case of Japan indicates, further research is needed before this hypothesis can be confirmed.

Finally, the analysis strongly suggests that hypothesis three (voluntary instruments through partnerships and networks, supported by consolidated government policy, are most effective in bringing about greater resource efficiency) is likely to be true. As voluntary initiatives can be abandoned at any time, there is a prima facie case that government policies would consolidate private sector achievements and make sure that resource efficiency gains are not lost. However, as there is relatively little evidence of such a strong combination at the present time, further research is recommended as governments, local communities, and the private sector begin to work together towards this aim over the next decade or so. Learning from the good practice cases collected for this study would be a good starting point.

From the above conclusions, there are three basic considerations in establishing better policy for resource efficiency in developing countries. First, existing local initiatives, networks, and markets related to resource efficiency should be utilized in developing countries. Second, supply chains, especially led by multinational companies, should be utilized to provide technical upgrading and support to SMEs. Third, governments should provide strong political leadership and an appropriate regulatory environment.

It is clear that developing Asia-Pacific cannot hope to achieve the material standard of living enjoyed by developed countries and simultaneously protect environmental quality without radical improvements in resource efficiency. Strong political commitment, educated consumer demand, and strengthened vertical and horizontal networks and partnerships will all play a role in bringing about such reforms.

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Best Practice on Environmental Policy in Asia and the Pacific: Chapter 6

Policies for Environmentally Sustainable Transport

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This paper examines the transfer and diffusion of sustainable transport policies around the world and reviews the implications for policy-making in the Asia-Pacific region. Through a focus on a range of good practice case studies, this paper investigates why there are significant differences in the major factors involved in the transfer of sustainable transport policies depending on the geographical direction of transfer. Pattern matching analysis and comparative case study revealed that: there are significant transfers of sustainable transport policies from developing countries to both developing and developed countries; international organizations play a crucial role in policy transfers towards the South; the role of political leadership is important in transfers from the South; and the speed at which redistributive policies were diffused was slower than other kinds of policies. The case studies used in the analysis were collected by the project Research on Innovative and Strategic Policy Options (RISPO), which was led by the Institute for Global Environmental Studies, Hayama, Japan. It is part of a series of eight linked papers in this special issue of the *International Review for Environmental Strategies* (*IRES*). This study draws on the RISPO Good Practices Inventory to provide useful lessons for environmental policymakers in developing countries.

Keywords: environmental policy, sustainable development, sustainable transport, policy transfer, policy diffusion

1. Introduction

The dataset used for the analysis in this paper is based on a series of good practice case studies for sustainable transport. These were collected for the Research on Innovative and Strategic Policy Options (RISPO) sub-project of the Asia-Pacific Environmental Innovation Strategy Project (APEIS). A pattern-matching analysis was used to identify the case studies that involved policy transfer. These case studies were then categorized into four groups according to the direction of policy transfer between and among countries in the North and the South. A comparative case study was conducted focusing on the actors involved in the policy transfers and the characteristics of the policies that were transferred and diffused.

Some of the good practice cases show that the learning, transfer, and policy diffusion processes are actually ongoing in this field. For example, the bus rapid transit (BRT) systems in Quito in Ecuador and Bogotá in Colombia clearly referred to the pioneering BRT system in Curitiba, Brazil (Matsumoto 2002). BRT has now been transferred to Asia and is being widely diffused. Cities in both developed and developing countries are struggling to find sustainable transport solutions to meet the serious challenges of congestion, air pollution, and global warming resulting from urbanization and motorization.

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The pattern matching analysis revealed that there are significant transfers of sustainable transport policies from developing countries to both developing and developed countries, although literature on policy transfer has previously focused mainly on the northern hemisphere. Comparative analysis of the case studies indicates that international organizations play a crucial role in policy transfers towards the South, and that the role of political leadership is important in transfers from the South. The speed at which redistributive policies were diffused was found to be slower than other kinds of policies, presumably due to resistance from potential losers.

While there have been various studies on policy transfer, their geographical scope has been limited to developed countries, and the literature on policy transfer in the field of sustainable transport is very sparse. Therefore, this paper examines the transfer and diffusion of sustainable transport policies around the world and reviews the policy implications for the Asia-Pacific region.

2. Literature review

In the area of environmental policy, the concept of policy transfer (the process by which knowledge and experience of policy from one location is used in policy development in other countries and other political systems), is considered a powerful analytical tool in accounting for policy trends (Rose 1991). The concepts of policy transfer, policy diffusion, and lesson-drawing are discussed in detail in chapters 1–3 of the linked series of papers in this issue of the *International Review for Environmental Strategies* (King and Mori 2007a, 2007b, 2007c).

Existing literature on policy transfer mainly focuses on transfer among and from developed countries. Although there are some studies on policy transfer from the South to the North (Nedley 2000; 2004) and between countries in the South (Evans and Lana 2004), attention to the southern hemisphere is still very limited and there is a need to expand the policy transfer framework to identify or remove the directional issue as a constraint (Rose 1999; Stone 1999; Nedley 2000; Bennett 2001; Evans 2004a; 2004b).

3. Approach and methodology

Recognizing the lack of policy transfer studies that take in the Southern perspective, this paper attempts to analyze policy transfer in the area of sustainable transport by adopting "a three-hundred-and-sixty degree perspective" (Nedley 2000; 2004).

3.1. Research question

Dolowitz and Marsh (1996; 2000) identified seven key questions on the study of policy transfer: (i) why do actors engage in policy transfer? (ii) who are the key actors involved in the policy transfer process? (iii) what is transferred? (iv) from where are lessons drawn? (v) what are the different levels of transfer? (vi) what restricts or facilitates the policy transfer process? And (vii) How is the process of policy transfer related to policy "success" or policy "failure"? To properly explore the question of policy transfer to and from the South, the first focus of this research corresponds to the fourth question: from where are lessons drawn and where are they applied? Thus, the central research question is: "why are the factors involved in the transfer of sustainable transport policy instruments significantly different

depending on the direction of transfer (i.e. North–North, North–South, South–North, and South–South), and what are the primary reasons for these differences?"

3.2. Hypotheses

Hypothesis 1: International organizations play important roles in sustainable transport policy transfer.

Hypothesis 2: Strong political leadership can provide an opportunity structure for policy transfer.

Hypothesis 3: Policy innovations that utilize redistributive economic instruments are slow to diffuse.

Previous studies have identified the importance to the policy transfer process of international organizations or transnational networks acting as "agents of diffusion" (Jörgens 2001; Tews, Busch, and Jörgens 2003; Evans 2004c). Rose (1993, 105) stated that "intergovernmental and international organizations encourage exchanges of ideas between countries with similar levels of economic resources", mentioning the examples of the European Community and the Organisation for Economic Co-operation and Development (OECD). Rose also observed that the programs of international bodies such as the World Bank and United Nations agencies tend to focus on developing countries. Evans and Lana (2004) found that international organizations open up channels for lesson-drawing and policy transfer between developing countries by encouraging emulation of "best practice", and in some cases financing implementation of best practice projects.

Thus, via hypothesis 1, this paper first examines the role of international organizations in the transfer of sustainable transport policies in each direction of transfer.

Another important actor besides international organizations is government. Evans (2004c) developed the hypothesis that "changes in government can provide an opportunity structure for policy change to occur". In the transport arena, there have recently been some prominent policy changes initiated by city mayors, such as the introduction of BRT in Bogotá, and the congestion charge (road pricing) in London. Hypothesis 2 modifies that of Evans (2004c) to address the role of political leadership in policy transfer.

The background literature shows the need to take into consideration the specific characteristics of policy innovation. Redistributive or regulatory measures may be more difficult to apply than distributive or win-win policies, and thus determine the speed of policy diffusion. Based on a case study on diffusion of energy/carbon taxes, Tews, Busch, and Jörgens (2003) concluded that "policy innovations with a high conflict potential due to their redistributive effects are less likely to rapidly diffuse". Hypothesis 3 addresses this question.

3.3. Approaches

Evans (2004b) has identified four major approaches used in policy transfer analysis: process-centred approaches; ideational approaches; comparative approaches; and multi-level approaches. The process-centered approach considers the agents of transfer to be the critical factor in policy transfer. It contends that "policy learning is largely based on the interpersonal interaction between agents of transfer, bureaucrats and politicians within interorganizational settings", where there exists a "common kinship" and "agreed culture" (Evans 2004b). This approach can provide a descriptive understanding of policy development and explain certain aspects of the transfer process by demonstrating who has relationships

with whom, and it can describe how these relationships influence policy making. This approach has several shortcomings, however, such as insufficient reflection on the role of exogenous forces, too little

Table 1. Details of the case studies used in the study on policies for sustainable urban transport

Subtheme	Case studies	Cities and countries	Partner institutes
Development of environmentally sustainable transport systems in urban areas	22	Curitiba, Brazil; Beijing, China; Shanghai, China; Bogotá, Colombia; Quito, Ecuador; Fukuoka, Japan; Sapporo, Japan; Kathmandu, Nepal; Seoul, South Korea; Singapore; Bangkok, Thailand	Asian Institute of Technology, the Energy Research Institute of China, UNEP Collaborating Centre on Energy and Environment[a]

Notes: a. The name of the UNEP Collaborating Centre was changed to UNEP Risoe Centre on Energy, Climate and Sustainable Development in 2003.

empirical evidence, and an almost exclusive focus on voluntary policy transfer between developed countries.

Ideational approaches focus on how politicians and policymakers "learn how to learn", and address the issue of when and how this learning takes place. Four categories of ideational approach have been identified: discursive, epistemic community, social learning, and organizational learning (Evans 2004b). Although this approach can help policy analysts in identifying potential obstacles to policy transfer, and give insights into how to develop a "learning" organization, it has been criticized for its empirical weakness.

Studies that use a comparative approach normally compare two cases, or analyze a cross-national aggregate sample. However, the comparative approach has a danger of overemphasizing broader structural factors and can overlook the role of agencies or the process of transfer itself. In addition, proving that policy transfer actually took place is sometimes difficult using such approaches (Evans 2004b).

Multi-level approaches are characterized by "a concern with understanding outcomes of policy transfer through combining macro and micro, or macro, meso, and micro levels of enquiry" (Evans 2004b, 20). This approach can yield the most comprehensive explanations of policy transfer but can be too complex due to the identification of too many variables. Careful theorization and appropriate integration of levels of analysis is necessary.

This paper employs the comparative approach using 22 good practice case studies collected from cities in Asia and Latin America for the sustainable transport sub-project of RISPO, in collaboration with participating research organizations (see table 1).

Good practice cases were selected to cover various issues around sustainable transport including: integrated land-use planning (Matsumoto 2002; Dhakal 2003a); public transport (Zhu, Yu and Jiang 2003; Yu 2002a; Lee 2003; Rogat 2003; Matsumoto 2002; Memon 2003); bicycle lanes (Zhu 2004) ; traffic-demand management, such as road-pricing (Dhakal 2003a; Yoon 2003); car-free days

(Laosirihongthong *et al*. 2004); car sharing (Matsumoto 2003); environmental education on car use (Matsumoto, 2004); regulation of emissions from gasoline vehicles (Liu 2003; Zhu and Jiang, 2003a; Pant, Kumar, and Shrestha 2004a, 2004b); and alternative fuel vehicles (Yu 2002b; Zhu and Jiang 2003b; Dhakal 2003b). Another important criterion in the selection of good practice cases was their applicability to developing countries in the Asia-Pacific region. Information about the 22 good practices with respect to critical instruments, impacts, lessons learned, and their potential for application, was collected based on a literature review, interviews with experts and people concerned, and an interactive workshop with policymakers.

The analysis of the case studies combined a qualitative, comparative, case-by-case analysis with a relatively simple form of textual pattern matching based on that proposed by Yin (2002). Pattern matching analysis was done for three categories of variables: actors, policy content, and processes. Pattern matches were sought against approximately 540 possible explanatory factors. For the details of this methodology, see chapter 3 of this linked series of papers (King and Mori 2007c).

The pattern matching analysis on process factors helped to screen the 22 good practice cases to focus on those that clearly involved a process of policy transfer. The selected cases include: car sharing in Fukuoka (Matsumoto 2003); travel awareness initiative in Sapporo (Matsumoto 2004); emission standard in Beijing, Shanghai, and Bangkok (Liu 2003; Zhu and Jiang 2003a; Pant, Kumar, and Shrestha 2004a); BRT in Curitiba, Quito, and Bogotá (Matsumoto 2002; Lee 2003; Rogat 2003); road pricing in Singapore (Dhakal 2003); and a number-plate bidding system in Singapore (Dhakal 2003) and Shanghai (Liu 2003).[1]

Based on the screening results, cases of policy transfer were categorized according to the direction of policy-transfer among locations as follows: (i) from developed to developed countries (North–North transfer); (ii) from developed to developing countries (North–South transfer); (iii) from developing to developed countries (South–North transfer); and (iv) from developing to developing countries (South–South transfer).

The definition of "developing country" is crucial to the categorization of the direction of policy transfer. This study follows the definitions used by the OECD in its list of aid recipients (OECD 2005). Among the locations where good practices were collected, Singapore needs special consideration. It transferred from developing country to developed country status in 1996, so accordingly this study treats Singaporean policies introduced before 1996 as developing country policies and those introduced after that year as developed country policies.

Based on the categorization, policy transfer cases were analyzed qualitatively and compared, with a focus on the other two key groups of variables—actors and policy content—as independent variables.

This methodology has some advantages over the past studies of policy transfer. First, by analyzing multiple cases the results are broad in scope. Second, the analysis is based on more detailed data than can be gleaned from a cross-national aggregate sample. Third, it focuses on two independent variables and avoids too much complexity, which is one of the drawbacks of a multi-level approach.

1. Exceptions are road pricing, number plate bidding system, and car sharing. In all of these case studies, the case study texts did not refer to policy transfer, but external sources provided additional information.

On the other hand, the limitations of this methodology reveal the need for additional research. First, more in-depth data collection on the process of policy transfer is required in order to grasp the entire policy-transfer process in each case. Second, although the Good Practice Inventory on which this analysis is based (http://apfed-db.iges.or.jp/rstbpp.php) was developed to provide an information database for decision making (in other words, to facilitate policy transfer), it was not specifically developed for the sake of research into policy transfer processes. For this purpose the number of sample cases should be increased. Third, more research is needed into the impact of broader structural factors on micro-decision-making settings, as proposed by Davies and Evans (1999), whereas this analysis is focused on decision-making in organizations.

Table 2. Categorization of policy transfer cases

Direction	Policy option	Source and year of adoption	Borrower and year of adoption
North–North	Car sharing	Dortmund, Germany (around 1990)	Fukuoka, Japan (2002)
	Travel awareness initiative	Adelaide, Australia (1996)	Sapporo, Japan (2000[a])
North–South	Car-free days	Europe[b](1998)	Bangkok, Thailand (2001)
	Emission standards	Europe (1992, 1996[c])	Beijing, China (1998,[d] 2003[e]); Shanghai, China (1999,[f] 2002[g]) Thailand[h] (1993)
		Taiwan (1992[i])	Thailand[j] (2001)
South–North	Bus rapid transit	Curitiba, Brazil (1974)	Los Angeles, USA (1999)
	Road pricing	Singapore (1975)	London, UK (2003)
South–South	Bus rapid transit	Curitiba (1974)	Quito, Ecuador (1995), Bogotá, Colombia (2000)
	Number-plate bidding system	Singapore (1990)	Shanghai (2000)

Notes: a. Pilot test was conducted in 1999. b. When the walking street scheme in Bangkok was introduced, no specific city was referred to, although the National Energy Policy Office was aware of the experience of other cities, including Paris (*The Nation* 2001). c. The Euro 1 standards were adopted in 1992 and the Euro 2 standards in 1996. d. The standard was issued in 1998 and came into effect in 1999. e. Euro 1. f. Euro 1. g. Euro 2. h. This good practice focuses on motorcycles and does not include four-wheeled vehicles. i. Taiwan has implemented three phases of emission standards since 1992 with increasing strictness (Manufacturers of Emission Controls Association 1999). j The same applies for Thailand as Taiwan (see note i).

4. Findings

4.1. Results from pattern matching

In relation to actors, the role of civic engagement (e.g. public-private partnerships and industry associations) was noted in about one third of the cases. More significant, however, was the role of local government (in 86 percent of cases) and sectoral agencies at the national level (36 percent). From an institutional perspective, the key success factor was the availability of funding (91 percent) sourced from local government (50 percent), external sources (45 percent) and the private sector (32 percent).

The possible importance of "user-pays" systems to recover part or all of the capital costs was noted in 27 percent of the cases. The role of the private sector (59 percent), technical advisers (41 percent) and NGOs (23 percent) in these successful cases was also notable.

The analysis of policy content, perhaps surprisingly, shows the almost equal importance of direct intervention (50 percent), command-and-control measures (50 percent), and market-based instruments (55 percent). Under command-and-control measures, the use of permits and restrictions was the most important policy instrument (45 percent), while under direct interventions, tax-funded infrastructure (50 percent) was the main instrument used. This shows that there is no "one-size-fits-all" approach to successful policy intervention in the domain of sustainable transport. Several cases demonstrate combinations of these success factors indicating that optimal policy mixes may be more important than single policy instruments.

One of the noteworthy results of the coding analysis regarding the sustainable transport policy process relates to the "source of policy innovation." The coding analysis revealed that, out of 22 good practice cases documented, only two—the road pricing and number-plate bidding system in Singapore (Dhakal 2003) and the BRT system in Curitiba (Matsumoto 2002)—were authentic policy innovations. Ten good practice cases were clearly "transferred" from innovation in other countries. The sources of policy innovation were not only from developed countries but also developing countries, as discussed in detail in the following sections.

4.2. Categorization of policy transfer cases

Following the results from the pattern matching, this study identified eight policy transfer cases and categorized them according to the direction of policy transfer, as shown in table 2.

It should be noted that even if two different cities adopt similar policies, those policies might have originated in different places meaning there is no real transfer. To avoid inclusion of such cases in this study, the evidence of transfer was confirmed by tracking the texts of good practice inventory and external sources that included newspaper articles, interviews, and personal communication.

a. North–North transfer

For North–North transfer, two policy innovations were identified: car sharing and travel awareness initiatives. A car sharing system can be thought of as organized short-term car rental (Shaheen et al. 1998). The first car sharing system was introduced in 1987 in central Switzerland. Another program started shortly afterwards in Zurich and around a year later a similar scheme was introduced in Berlin. These developments took place independently of one another. In Switzerland, the idea of car sharing soon resulted in successful growth (Muheim and Partner 1998). Schemes subsequently spread to Austria and the Netherlands. More recently, car sharing organizations have been established in the UK, Denmark, Italy, France, Ireland, Norway, Scotland, and Sweden, as well as in Canada and the USA (Enoch 2002; Shaheen et al. 1998). Car sharing has recently started in a small way in Australia. In Asia, car-sharing schemes have been introduced in Singapore since the late 1990s and Japan since the early 2000s. The staff of a car sharing scheme in Fukuoka, Japan, called the Car Sharing Network, actually visited the Stadtauto car sharing system in Dortmund, Germany (Matsumoto 2003). Fukuoka's car

sharing system also received technological support from the CEV Sharing Corporation in Yokohama, which started the business about six months earlier.

Travel awareness initiatives began to be introduced worldwide in the 1990s. Such programs aim to change travel behavior through, for example, providing targeted information on transport through campaigning and education. Examples include: the TravelWise campaign and the Headstart program in the United Kingdom; the Individualized Marketing Demonstration Program, developed in Europe and later applied in Australia; and the Travel Blending program that started in Australia and was later introduced in the UK, the United States, and Chile (Brog and John 2001; Rose and Ampt 2001). Japan's Travel Feedback program was developed based on the Travel Blending program in Adelaide, Australia.

b. North–South transfer

For North–South transfer, car free days and emission standards were identified as examples. Car-free days are "a limited one-day experiment in banning motorized vehicles from street access" (Wright 2004). The first major nationwide movement of car-free days was started in France in 1998, although Germany upstaged them by holding a car-free event three months earlier. The concept of a pan-European car-free day was promoted in 2000 when the European Commission's Environmental Directorate became a member of the supporting consortium. International Car Free Day is now annually held on 22 September. Bangkok's Silom Street was closed for vehicles and opened for walking and public activities on seven consecutive Sundays in 2001 (Laosirihongthong *et al*. 2004). Other cities outside of Europe that hold a car-free day include Jakarta in Indonesia, Taipei in Taiwan, Bogotá in Colombia, and Toronto in Canada.

Emission standard refers to the maximum amount of air-polluting discharge (such as carbon monoxide, sulphur dioxide, and particulates) legally allowed from a single mobile or stationary source. There are three main international approaches to mobile emission standards: European (Euro), American (Tier), and Japanese. The European Union (EU) adopted Euro 1 standards in the early 1990s and introduced tighter standards in several steps: Euro 2 in 1996, Euro 3 in 2000, and Euro 4 in 2005. Most countries in Asia have subsequently adopted the European standards, albeit with a slight time lag. Chinese cities such as Beijing and Shanghai adopted Euro standards for light-duty vehicles ahead of the national schedule. The Beijing municipal government issued the Euro 1 standard in 1998, which came into force in 1999, and introduced the Euro 2 standard in 2003. Shanghai's local government started implementation of Euro 2 in 2002. With regard to two-wheelers, Thailand enforced the standards in four steps. The first two in 1993 and 1995 were based on European standards and the fourth step introduced in 2001 was similar to the Taiwanese standard, considered to be the most advanced standard for two-wheelers (Asian Development Bank 2003).

c. South–North transfer

In the category of South–North transfers, BRT and road pricing were identified. BRT is a system that emphasizes priority for, and rapid movement of, buses by securing segregated busways (International Energy Agency 2002). The BRT concept began in Curitiba and this policy option is being transferred both toward the North and the South. In North America, a number of cities have begun to develop BRT systems, including Honolulu, Los Angeles, and Pittsburgh in the United States, and Ottawa in Canada. In Oceania, Adelaide and Brisbane in Australia have adopted BRT systems. In Europe, BRT is

becoming increasingly common. In the UK alone, there are schemes in Ispwich, Leeds, London, and Reading. In the South, BRT is becoming widespread in the South American region. In Brazil there are BRT programs in Belo Horizonte, Campinas, Goiania, Porto Alegre, Recife, and Sao Paulo. There are also BRT schemes in Bogotá and Quito. Cities in Asia are also starting to introduce BRT. There are systems in Jakarta, Nagoya in Japan, Seoul, and Taipei. Introduction of BRT is being considered in Bangkok, Beijing, Delhi and Hyderabad in India, and Dhaka in Bangladesh (International Energy Agency 2002; Wright and Fjellstrom 2002; Institute for Transportation and Development Policy 2003; Fjellstrom 2003a, 2003b; Levinson *et al*. 2003).

Road pricing means that motorists must pay directly for driving on a particular roadway (Litman 2004). In 1975 Singapore was the first country in the world to implement an area road-pricing mechanism, called Area Licensing System (ALS). In 1998, ALS was replaced by Electronic Road Pricing (ERP), a technically advanced mechanism that enables varied charges over time and location. In Europe, road-pricing schemes are in place in Bergen, Oslo, and Trondheim (all in Norway), which started in 1986, 1990, and 1991 respectively (Schwaab and Thielmann 2001; PRoGR€SS 2004). In London, a road-pricing scheme aimed at congestion management, called the congestion charge, came into force on 17 February 2003 (Transport for London 2005).

d. South–South transfer

Two policy options fell into the category of South–South transfer. One is BRT (Matsumoto 2002; Lee 2003; Rogat 2003), dealt with above, the other is the number-plate bidding system (Dhakal 2003; Liu 2003). First introduced in Singapore as the Vehicle Quota System (VQS) in February 1990, the VQS is an innovative mechanism to limit the total number of vehicles on the road, and uses a market-based approach. In the VQS, the government fixes the total number of vehicles allowed on the road, and prospective vehicle owners must obtain a certificate for owning a vehicle through open bidding. Shanghai introduced similar measures to control the number of plates issued since 1986 and brought in a bidding system similar to Singapore's VQS in 2000 (*Wall Street Journal* 2004; Liu 2005).

Variations in the extent of transfer of the cases shown in table 2 should be noted. For example, the travel awareness initiative in Sapporo (the Travel Feedback program, Matsumoto 2004), was developed based on Adelaide's Travel Blending program. In the case of car free days in Thailand (the Walking Street program) it is obvious from a speech by the Deputy Prime Minister that the National Energy Policy Office (NEPO) was aware that other cities, such as London and Paris, had similar programs (*The Nation* 2001). However, at the design stage of the program, the task force given responsibility for the project by NEPO did not review any practice from other countries and relied mainly on expert discussions (Laosirihongthong 2005). The degree of the transfer in the latter case is limited to inspiration, whereas the former case heavily relies on the original.

4.3. Key actor variables

The key actor variables in these various examples of policy transfer were identified based on the texts of the RISPO Good Practices Inventory and external sources, which included newspaper articles, information obtained from interviews, communication with the concerned individuals, and other

literature (table 3). In this analysis, *key actor* refers to organizations or individuals that were engaged in: seeking the policies or programs to be transferred; making decisions about the introduction of policies or programs; developing the details of policies or programs in the borrowing location; and funding the policies or programs. The term excludes those who took part in implementation stages. The main categories of actor follows the work of Dolowitz and Marsh (1996 and 2000), and includes elected officials; political parties; bureaucrats and civil servants; pressure groups; policy entrepreneurs and experts; transnational corporations; think tanks; and supra-national, governmental, and NGO consultants. Four new categories (domestic NGO, private company, citizens, and government of foreign country) were added to the list since they did not fall into any of the categories of Dolowitz and Marsh.

Table 3. Key actors in policy transfer, by direction of transfer and individual policy

	North–North policy transfer		North–South policy transfer		South–North policy transfer		South–South policyt transfer	
Key actor categories	Car sharing	Travel awareness initiative	Car-free day	Emission standard	Bus rapid transit	Road pricing	Bus rapid transit	Number plate auction
Elected officials	–	–	–	–	Mayor	Mayor. Local councils	Mayor	–
Political parties	–	–	–	–	–	–	–	–
Bureaucrats/civil servants	Local government	Regional branch of national government	National government	Local government National government	Local transport authority Local government	Local government body for transport	Local government Public institutions National government	Central government Local government Police officers
Pressure groups	–	–	–	–	–	Representatives of businesses and road users	–	–
Policy entrepreneurs and experts	–	Academia	Academia	Academia	–	Public institutes	–	–
Transnational corporations	–	–	–	–	–	–	–	–
Think tanks	–	Development engineers	–	–	–	–	–	–
International organizations	–	–	–	European Union	–	–	International development bank	–
Consultants	–	–	–	–	–	–	–	–
Domestic NGOs	Environmental NGOs	–	–	–	–	–	–	–
Private companies	Power company	–	–	–	–	–	–	–
Citizens	–	–	–	–	–	General public	–	–
Foreign government				US Environmental Protection Agency				

In relation to hypothesis 1 (international organizations play important roles in sustainable transport policy transfer), the role of an international organization was found important only in the South–South transfer of BRT. For transfer to Bogotá, the World Bank was one of the funding sources for infrastructure of the BRT system. However, it should be noted that it was not the only funding source and other sources included the national government, the Bogotá Mayor's Office, and stakeholders from the transport sector (Lee 2003). On the other hand, in the case of Quito, international organizations were the only funding sources: the Spanish Development Fund and the Spanish Banco de Bilbao Vyzcaya funded the total cost of the first 11.2 km trolley-bus line (US $57.6 million) (Rogat 2003).

The importance of international organizations in South–South transfer is demonstrated in the now booming transfers of BRT. The Institute for Transportation and Development Policy (ITDP) assisted with the development of BRT in Jakarta in 2004, and other examples include the World Bank in Hanoi (Vietnam), EMBARQ in Shanghai, the Asian Development Bank in Manila (the Philippines), the India Institute of Technology in Delhi, and the Energy Foundation in China (Ernst 2005).

Conversely, in North–South policy transfer international organizations played only minor roles. For example, in the study carried out by Tsinghua University one of the actors in the introduction of Euro standards in Beijing received financial support from the EU and USEPA (Jiang 2005). Although there is no documentation specifically mentioning the policy transfer cases examined in this chapter, some countries in Asia relied on the United Nations Economic Commission for Europe (UNECE) in adopting the Euro standard (Asian Development Bank 2003). Except for South–South policy transfer, the examined cases did not show significant evidence of involvement of international organizations. However, it should be noted that potential agents of North–North policy transfer exist outside Asia, such as the European Conference of Ministers of Transport (ECMT) and the OECD. However, since our focus when collecting the case studies was on good practices potentially applicable to developing Asian countries, the role of those organizations is not reflected in this analysis.

International organizations not only play an important role in policy transfer as "policy entrepreneurs", but may also play a coercive role by demanding policy reform as a condition of lending (Evans and Lana 2004). Where the desire for funding is greater than the commitment to the policy reform, implementation is generally less than successful.

Regarding Hypothesis 2 (strong political leadership can provide an opportunity structure for policy transfer), political leadership played a prominent role in three of the policy transfer cases. The first is the transfer of road pricing from Singapore to London. In 2000 the Mayor of London Ken Livingstone included proposals for a scheme to reduce congestion in London in his election manifesto, and was later instrumental in introducing the congestion charge when in office (Transport for London 2005). The second is the adoption of BRT in Bogotá (Lee, 2003), which drew on the extant system in Curitiba. Enrique Penolosa was mayor when the city introduced the system, and his commitment and expansive vision were key to its success. A third example is the introduction of BRT in Los Angeles. Los Angeles started to develop its BRT system after a visit by the then Los Angeles mayor Richard Riordan to Curitiba (Hook and Wright 2002).

Table 4. Policy content and transfer flow, by transfer direction and policy

	North–North policy transfer		North–South policy transfer	South–North policy transfer		South–South policy transfer		
Major policy content	Car sharing	Travel awareness initiative	Car-free day	Emission standard	Bus Rapid Transport	Road pricing	BRT	Number plate auction
Command-and-control instruments	–	–	–	Setting emission standard	–	–	–	–
Market-based instruments	–	–	–	–	–	Charging entry to city centre	Cross subsidy by single fare	Price setting through bidding mechanism
Direct intervention	–	–	–	–	Provision of busways and related infrastructure	–	Provision of busways and related infrastructure	–
Creation of new markets	Funding for launch	–	–	–	–	–	–	Creation of bidding market for number plates
Information-based instruments	–	Educational program development	Awareness-raising activities	–	–	–	–	–

A common element in these three cases is the institutional arrangement of local transport bodies. Transport for London (TfL) was responsible for both the planning and implementation of the mayor's transport strategy. It made recommendations to the mayor on the final plan of the congestion charge scheme after consideration of the results of public hearings. TfL is responsible not only for congestion charges but also for buses, subways, the light-railway system, traffic management, and so on (Transport for London 2005). Bogotá created a new public company, TransMilenio SA, to oversee the development and operation of the BRT system (Wright 2004). The BRT program (Metro Rapid Program) in Los Angeles was initiated by the Board of Directors of the Los Angeles Country Metropolitan Transportation Authority (Metro), which is responsible for transportation planning, coordination, construction, and operation of the city's transport systems (Metro 2005). In all three cases the city mayor chaired the board of the city transport body.

Another example where the role of political leadership was instrumental in policy transfer is the introduction of BRT in Seoul in 2004. The Mayor of Seoul, Lee Mung-Bak, visited Curitiba in January 2002 just after his election. He then invited Jaime Lerner, the former mayor of Curitiba who introduced the BRT system, to visit Seoul in March and advise on improving the capital's transport system (*Chosun Ilbo* 2003). This is a case of policy transfer promoted not only by a political leader on the borrower's side but also on the source's side.

Table 3 shows that bureaucrats also play significant roles in all cases of sustainable transport policy transfer. Transport policies are usually set at the local level, except for national standard setting or taxation, and it is normal that local governments are involved in the process of policy formulation. However, the results showed that national governments are also important players, not only in setting national standards (for example, emission standards), but also in local policies and programs. For example, the Walking Street program in Bangkok was initiated and funded by NEPO, a national agency. Also, the travel awareness initiative in Sapporo was initiated and implemented by the Hokkaido Regional Development Bureau, a regional development branch of the Ministry of Land, Infrastructure and Transport (Matsumoto 2004). In the case of BRT in Bogotá, the national government was involved in funding a part of the infrastructure of the system. One of the drivers behind the introduction of the number-plate auction system in Shanghai was pressure from central government to discard the high fees to obtain vehicles (Zhou and Sperling 2001).

Involvement of national governments is observed in all cases of policy transfer towards the South. On the other hand, in policy transfers towards the North, only one case was found where a national government played a role.

4.4. Characteristics of innovation

Table 4 summarizes the policy contents that were transferred. Transfers of command-and-control policies are found for car-free days and emission standards—both North–South transfers (*The Nation* 2001; Zhu and Jiang 2003a; Liu 2003; and Pant, Kumar, and Shrestha 2004a). Market-based instruments are transferred in road pricing (Dhakal 2003a), BRT (South–South transfers) (Lee 2003; Rogat 2003), and number plate auctions (Dhakal 2003a; Liu 2003). Also in the case of BRT, direct intervention policies involving the provision of infrastructure were transferred. Transfer of "creation of new markets" is observed for car sharing, and "information-based instruments" for the initiative on travel awareness and car-free days.

Table 5. Speed and scale of diffusion according to major policy instrument

Major policy type	Policy option	Speed and scale of diffusion
Command-and-control	Emission standard	Most Asian countries introduced at least Euro 1 within 10 years since establishment of Euro 1 in 1992.
Market-based instruments	Road pricing	Adoption in London was 28 years from Singapore's innovation in 1975. This scheme is introduced in only a small number of cities.
	Number plate auctioning	Shanghai adopted this scheme within 10 years from the innovation in Singapore. No other city has introduced this scheme.
Direct intervention	Bus rapid transit	BRT has spread steadily to North and South American cities for a quarter of century. It started to quickly expand to cities in Asia in the early 2000s.
Creation of new markets	Car sharing	Car sharing was spread in European cities in the 1990s and transferred to North America and developing Asia 10 years after initiation.
Information based instruments	Travel awareness initiative	Travel awareness initiatives were starting to be introduced in the 1990s in UK and Australia and introduced in Japan 10 years later.

Table 5 shows the differences in speed and scale of policy diffusion according to major policy type. It is noteworthy that road pricing has taken a long time to be diffused compared to other policy options. Congestion charging was introduced in Norway 15 years after the ALS innovation in Singapore, and 28 years after in London, yet despite its clear success in reducing congestion few cities have had the courage to follow suit. For number-plate auctioning—the other redistributive economic instrument—it took less than 10 years for the first transfer to take place, but the number of occurrences is so far limited to only one city. The above observations appear to confirm hypothesis 3: policy innovations that utilize redistributive economic instruments are slow to diffuse.

Another noticeable phenomenon of diffusion relates to BRT. Since the launch of Curitiba's BRT in 1974, several North American and Latin American cities have introduced segregated busway systems. It started to attract attention from Asian cities after Bogotá successfully transferred the system in 2000 and BRT plans are now booming in Asia. This indicates the possibility of a boosting effect of one successful transfer on the speed of diffusion. It is almost as though one case is seen as a "fluke", while the second (and subsequent) case(s) demonstrate that this policy is worthy of universal application. Therefore, it will be very interesting to keep an eye on the diffusion of road pricing after the successful transfer to London.

Table 5 shows that the innovative policies developed in Curitiba and Singapore were transferred to other countries and diffused. The true core of the innovations in Curitiba and Singapore was the unified approach and the integration of land-use planning: BRT, road pricing and number-plate auctions are part of their integrated planning policy. However, the transfer of the all important land-planning component in those cities was hardly observed in the transfer process. This might be explained by the lack of standard technical solutions in land-use planning (Tews et al. 2003), or it could be that the land-use

planning involves winners and losers in the property market, and this aspect is viewed as excessively redistributive.

Another explanation could be isolated sectoral thinking. Usually land-use planning involves policy from sectors other than the transport sector. Without good cross-sectoral communication and high level coordination, the officials responsible for land-use planning policy may not be brought into the picture early enough. Dolowitz and Marsh (2000) refer to transfers that are missing crucial elements of what made the policy or institutional structure a success in the originating country as "incomplete transfer." In planning transfers of policies such as BRT and road pricing, policymakers should pay attention to those factors.

5. Conclusions

It was found that many good practices in the field of sustainable transport are actually transferred from other countries. In the case of the good practices collected for RISPO, only three cases, namely BRT in Curitiba, and road pricing and the number-plate bidding system in Singapore, were genuinely national innovations.

Although policy transfer literature generally focuses on transfer in the North, this research shows that there are also significant transfers from developing countries to both developing and developed countries. South–North transfers include BRT from Curitiba to Los Angeles, and road pricing from Singapore to London. Examples of South–South transfer were BRT from Curitiba to Quito and Bogotá, and the number-plate bidding system from Singapore to Shanghai.

The hypothesis on policy transfer actors (international organizations play important roles in sustainable transport policy transfer) was supported with regard to South–South transfer (transfer of BRT) and North–South transfer (emission standards), although their role was quite limited in the latter case. This hypothesis was not supported in the other directions of policy transfer, at least by this set of case studies.

Hypothesis 2 (strong political leadership can provide an opportunity structure for policy transfer) was supported for South–North and South–South policy transfer. Mayors played a central role in the transfer of road pricing to London and the transfer of BRT to Los Angeles and Bogotá. Mayoral leadership was supported by specialized institutions, development plans, and implementation strategies that reflected the leader's vision. No supporting evidence was found for their roles in North–North and North–South transfer from the examined cases.

All the sample transfer cases showed that bureaucrats played significant roles. It was noteworthy that not only local governments but also national governments were involved in the policy transfer process. The forms of involvement of national government included initiation, implementation, and funding of the program, or influencing the policy decisions through pressure on local government. National government roles were observed in all the sample transfer cases towards the South but in only one case towards the North.

Regarding policy content, the sample transfer cases showed a tendency towards transfer of market-based instruments and direct intervention from the South to both the North and the South, and

information-based instruments from the North in both directions. The creation of markets as an instrument was found to be transferred within the same hemisphere, that is, in North–North and South–South transfers.

Hypothesis 3 (policy innovations that utilize redistributive economic instruments are slow to diffuse) was verified for diffusion originating in the South. Compared to other policy options, road pricing has taken a longer time to diffuse and the number of adoptions of both road pricing and number-plate auctioning are much smaller.

Further research on other key questions of policy transfer, such as the motivation of policymakers to transfer policies, the degree of the transfer, and the barriers to and facilitators of the process, will deepen understanding of the policy transfer process in the area of sustainable transport (Dolowitz and Marsh 1996). Employing a multi-level approach through incorporation of macro-level factors, such as socio-economic background, into the analysis of policy transfers will provide a more comprehensive account. In addition, although this study focuses on "good" policy transfers based on good practices, comparison with "failed" transfer cases to identify those factors that define success and failure would be of benefit for future policy making. Furthermore, cross-sectoral perspectives need to be incorporated in future research, since transportation is not an isolated sector but interrelated with many aspects of urban development. Therefore, to provide meaningful inferences for the development of sustainable development policy, further studies on transfers in other policy areas related to sustainable development are necessary to more clearly distinguish the commonalities and differences regarding the direction of policy transfer, and the defining factors in each direction.

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Metro s*ee* Los Angeles Country Metropolitan Transportation Authority.

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Best Practice on Environmental Policy in Asia and the Pacific: Chapter 7

Participation of Civil Society in Management of Natural Resources

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Governments are increasingly involving local communities and non-governmental organizations in the management of natural resources. The ways in which different stakeholders are involved varies from being consulted to taking a central role in planning and monitoring, and—infrequently—being given the legal right to manage resources. There can be many benefits from involving a wider group of stakeholders in natural resource management, including reducing the burden on government agencies, reducing conflicts, and greater resource efficiency. This is part of a series of eight linked papers in this special issue of the *International Review for Environmental Strategies* describing a study to draw from the RISPO Good Practices Inventory useful lessons for environmental policymakers in developing countries. The study was based on analysis of case studies collected by the project Research on Innovative and Strategic Policy Options (RISPO), which was led by the Institute for Global Environmental Studies, Hayama, Japan. This study highlights how participation by different stakeholder, governments, local/indigenous people, NGOs and the private sector, in natural resource management in Asia leads to resource efficiency for the government, contributes to broader devolution of power, and reflects the changing attitude of governments towards people's participation. The findings should encourage governments to extend community management of natural resources to other ecosystems, such as coastal fisheries or production forests.

Keywords: environmental policy, RISPO, natural resource management, community-based tourism, civil society, environmental education, participation

1. Introduction

Experiences in co-management of natural resources since the latter half of the twentieth century have shown that where the right incentives are offered and roles are clearly defined, management of natural resource through participatory processes can work. Today, local communities and civil society organizations are important actors in designing and implementing policies aimed at improving environmental management and pursuing sustainable development. Government decentralization policies, which confer decision-making authority and fiscal autonomy on local governments and, in some cases, to local communities, have helped local people and organizations to play a leading role in developing and undertaking environmental management and sustainable

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development projects. Economic liberalization has also provided local people and communities with diverse opportunities to pursue alternative sustainable livelihoods.

Governments are increasingly recognizing a need to allow greater participation in environmental responses, including natural resource management. When environmental problems first started to gain international attention as a potential policy issue, governments initially tried to deal with them on their own. They generally did this by imposing rules, norms and limits upon those perceived as most responsible for environmental degradation. This early exclusion of other stakeholders, especially local communities, from natural resource management and environmental protection efforts can be attributed to governments' lack of confidence in participatory processes and their perception that local people were a main cause of environmental degradation.

Time and experience have shown that governments are not always in a strong position to put into place the right policies and implement effective programs and projects to manage natural resources. As a result, other stakeholders such as communities, non-governmental organizations (NGOs), and the private-sector are being included more frequently in environmental responses. Different countries are at different stages of this policy evolution, depending on their ecological, socio-economic, political and cultural conditions. Some of the reasons that have prompted decentralization and an expanded role for civil society include: increased environmental problems; limitations on government capacity and resources; a greater need for accountability, transparency, and promotion of good governance and sustainable management, particularly due to pressure from donors; increased public awareness; and the urgency of dealing with environmental issues. In some cases, this change has been gradual whereas in others it has seen a complete policy reversal.

Local participation can be more effective if the community understands the value of its participation, what is required of it, and the necessity of working jointly with the government and other organizations. NGOs have generally been the main providers of environmental education and public awareness raising, particularly in developing countries. They have also helped communities to launch and run community-based tourism projects and to use the community's first-hand knowledge, which has been accumulated over centuries, to manage and protect their local environments.

This chapter presents the findings of a recent study on the overall theme of the policy trend towards the retreat of "big" government and the greater involvement of civil society in natural resource management. The study aimed to find valuable lessons for policymakers in developing countries. It took as its main dataset good environmental policy practices documented as part of the IGES-led Research on Innovative and Strategic Policy Options (RISPO) on the inter-related topics of promoting environmental education by NGOs, facilitating management of protected areas using community-based tourism, and promoting sustainable resource management based on local and indigenous knowledge. As such it forms part of a series of linked papers that is presented in this issue of the *International Review for Environmental Strategies*.

2. Literature review: participation in environmental policymaking

2.1. The rise of participatory processes in the environmental sphere

The promotion of active participation by stakeholders other than the government, especially in the management of natural resources, can be traced back to the late 1960s, during the preparatory phase for the United Nations Conference on the Human Environment in 1972. Since then several important international conventions and forums, such as the World Commission on Environment and Development (Brundtland Commission) in 1987, have reiterated the importance of public participation for better management of the environment and natural resources. The Brundtland Commission's report, *Our Common Future*, states that "sustainable development requires a political system that secures effective citizen participation in decision making" (World Commission on Sustainable Development 1987, p. 65). The extent to which public participation has been actively sought by governments has varied depending on many factors, such as the issues involved and the time and resources available. Since the mid-1990s, public participation in developed countries has focused on public inputs to local government planning, whereas in developing countries there has been a gradual move towards greater decentralization of decision making and participatory forms of democracy, providing mechanisms for community empowerment (Holmes and Scoones 2000).

Many factors have contributed to changing the approaches of governments from unilateral decision making regarding matters in the public domain to involving a variety of stakeholders. These factors include: increase in democratization, as mentioned above; concern among multilateral donor agencies corruption and lack of transparency in governments (Gaventa and Robinson 1999); expansion of NGOs and extension of their role into developing countries (Zazueta 1995); improvements in, and extended coverage of, education (Zazueta 1995); budget constraints, making governments look for cost-effective ways to provide services; and positive experiences with early participatory initiatives.

Some trends have been noted in public attitudes to the state as awareness about, and interest in, environmental and governance issues have improved. These include: a growing dissatisfaction with existing political structures for handling policymaking, especially with regard to environmental policymaking (Selman and Parker 1997); lack of confidence in elected representatives' ability to capture the diverse social and economic interests of the people (Selman and Parker 1997); declining faith in planning for, and the malleability of, society (Vos 2003); concerns about the effectiveness of government policies and their implementation; recognition of the complexity and uncertainty of environmental problems; and recognition of the role of values, ethics, and issues of justice as keys to environmental problems (Holmes and Scoones 2000).

Interest in participatory approaches has grown dramatically, especially in the area of local environmental planning such as Local Agenda 21 initiatives, approaches to watershed management, and development of community and local-area economic strategies (Healey 1998). Agenda 21, the global sustainable development strategy agreed at the 1992 United Nations Conference on Environment and Development (Earth Summit) in Rio de Janeiro, stressed the need for public involvement in designing and implementing many forms of environmental policy (Eden 1996). Local Agenda 21 (local

implementation of Agenda 21) has supported the development of innovative methods for working with and for the community (Freeman, Littlewood, and Whitney 1996). A survey in 2001 by the International Council for Local Environmental Initiatives (ICLEI; now renamed Local Governments for Sustainability) found that at least 6,400 local governments in 113 countries had been involved in the Local Agenda 21 planning process (ICLEI 2002). International bodies such as the UN Commission on Sustainable Development and the Organisation for Economic Co-operation in Development (OECD) have also played a role in the proliferation of multi-stakeholder processes (Meadowcroft 2004).

Participation can be attractive to governments by reducing the budgetary burdens of environmental protection. For example, in the case of protected area management, once involved in the process and given the right incentive, local communities on their own initiative help to patrol, stop poaching, and report cases of encroachment and other illegal activities (Schroeder 1999).

Participation can not only improve the quality of decision making by leading to better policy but it can increase the likelihood that policy implementation will be more legitimate, effective, efficient, and sustainable (Healey 1998; Holmes and Scoones 2000). Non-government stakeholders are more likely to support and comply with environmental policies if their own concerns are built into policy decisions and there is consensus about the way forward (Pelletier et al. 1999). There are numerous examples in developing countries where policies have failed due to their inability to match the needs and priorities of the "intended beneficiaries" because of lack of involvement of those "beneficiaries" when crucial decisions were made (Gaventa and Robinson 1999). Wider participation raises the public's confidence in the decision-making process while providing a focus for construction of common perspectives, agreed solutions, and interactions to realize commonly desired objectives (Meadowcroft 2004).

Another factor contributing to the rise of public participation, especially in developing countries, is the heavy reliance of government agencies on foreign development aid. This has made multilateral, bilateral, and international agencies particularly influential in shaping policy in developing countries. Since the donor community has long accepted the concept of participation, donors often make the inclusion of participatory processes a condition for funding. Donors' concerns regarding good governance and strengthening of civil society have also contributed to an increasing interest in participation in policy-making (Gaventa and Robinson 1999) and to ensure that checks are placed on companies that exploit natural resources, such as those in the timber industry. They see participatory processes as a way of ensuring that their funds are used wisely, increasing transparency and counteracting government corruption.

2.2. Defining civil society

Non-governmental organizations refers to independent non-profit groups of citizens that build on voluntarism and whose activities generally have an altruistic purpose have a long history. Many of the educational or social services provided by the state in modern secular societies were in earlier times provided by churches and religious orders (for example, the medieval Christian church in Europe from 1200). The earliest example of the modern type of NGO was the International Committee of the Red Cross, formed in Switzerland in 1865(Toulmin 1994). Since World War II there has been a continuous growth in the number and variety of NGOs. Many NGOs are viewed as being free of ulterior motives—

grinding no axes, acting according to equitable principles rather than favoring one country or group over another, speaking not for any government but for the people, and so on. Some international NGOs have the ability to mobilize responses around the world through their advocacy of humanitarian, environmental, medical, or human rights causes (Toulmin 1994).

Civil society is defined as referring to the arena of "uncoerced collective action around shared interests, purposes and values" by the Centre for Civil Soviety of the London School of Economics (London School of Economics 2004), and includes, along with the more traditional NGOs, trade unions, business associations, some research institutes, grassroots organizations, women's groups, and others. Its role has evolved and expanded due to political trends causing a diminishing of "big government" across the world. It has also contributed to greater participation of non-government stakeholders in the policy arena. In developing countries, grassroots organizations and NGOs have been encouraged to scale up their operations to take on delivering services that would normally be the responsibility of the state (Zazueta 1995). This has usually resulted from the government's lack of ability to provide basic facilities such as health and education. Holmes and Scoones (2000) observe that since the 1980s, these organizations have begun to take on a greater advocacy and collaborative role, for example demanding that citizen's voices be heard during the formation of government regulations and policies. According to Zazueta (1995), the role played by NGOs in awareness raising on critical issues has expanded the environmental knowledge of the public and policymakers alike. NGOs often bring expertise, commitment, and the public's views of issues to the policymaking process. They also provide early-warning and information-gathering services that help in setting the policy agenda and carry out independent monitoring of policy implementation. NGOs bring to policymaking a much greater range of information, perceptions, and potential solutions than official bodies could hope to generate on their own, since they work more closely with people on the ground. These functions are increasingly valuable to governments in developing countries as more of them are elected by popular vote and thus depend on developing policies to meet the needs and aspirations of the people they serve to stay in power (Tamang 1994). According to the NGO Freedom House, 122 of the world's 192 nations were electoral democracies in 2006 (Puddington 2006).

2.3. Institutionalizing participation

In places where there have been social movements to empower local citizens, such as in Indonesia and Thailand, this role has frequently been officially recognized by policymakers. In 1997, the new Thai Constitution ensured civil rights and civil liberties related to participation, including public participation in state decision-making processes, including policymaking. The provisions included guaranteeing the right to know (this was revolutionary in the sense that it requires bureaucrats to change their long entrenched unwillingness to share information with the public); freedom of the press; decentralization; and public involvement in natural resource management. Indonesia has made changes in this direction by devolving greater autonomy to the regions, allowing greater involvement of local-level authorities and of communities in resource management—and thus giving more power to the people (Institute for Global Environmental Studies 2005; Usman 2002).

The right to information and public participation on environmental policy matters has gained the force of international law through the United Nations Economic Commission for Europe Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters (Aarhus Convention), which was adopted in 1998 and entered into force in 2001. The Aarhus Convention has so far been ratified by 24 nations in Europe and Central Asia and signed by 40 (APFED 2005).

Representatives of civil society and the private sector are increasingly involved in joint forums with governments, UN agencies, and international organizations such as the World Bank (Zazueta 1995). Some of the mechanisms deployed to encourage greater participation include dialogue and consensus building instruments such as public enquiries, referendums, citizens' juries, mediation, conventions, and roundtables. These and other participatory policymaking approaches are discussed by Meadowcroft (2004).

Although governments are making efforts to give more say to the public in decisions concerning them, participation is bound to be limited until more reflexive institutional forms emerge that are genuinely responsive to new ways of thinking and acting (Holmes and Scoones 2000). Many unresolved questions in the literature need to be answered before participation becomes fully integrated into policy processes and not some routine charade that governments perform to fulfill their obligations to donors or international treaties.

2.4. Participation in natural resource management

Governments are increasingly involving stakeholders in the management of natural resources, including forests and other protected areas. The importance of local and indigenous knowledge (LINK) has been acknowledged in international forums since the early 1990s. Co-management of protected areas is also now recognized as an important way of sharing responsibility and helping in conflict resolution. Indigenous or traditional knowledge can be especially useful in natural resource management since it has been accumulated, adapted, modified, and used by communities over several generations so as to minimize ecological damage and degradation (Institute for Global Environmental Studies 2005; Sawhney 1998). Mclain and Jones (1997) suggest that local people often have a strong dedication to the well-being of their local ecology and possess an intimate knowledge of its socio-ecological particularities. Indigenous knowledge thus provides a more suitable base for management of resources at the local level than those defined by central governments, and can enrich and complement scientific knowledge and techniques of resource management. The importance and potential of this knowledge has been repeatedly emphasized in international discourse for achieving sustainable development in the past two decades, for example in Agenda 21 (United Nations 1992). Thus, the inclusion of civil society in traditional areas can improve the knowledge base for the design of policies by bringing into decision making more information and a wider range of experiences—both of which can contribute to more realistic policies (Holmes and Scoones 2000; Pelletier et al. 1999; Zazueta 1995).There are lessons to be learned from where participation has failed to improve the policies by addressing the causes of failure.

The value of indigenous knowledge and local communities' motivation to protect their natural environment is reflected in participatory management of protected areas, particularly when it is done

through nature-based tourism. Increasingly, community-based tourism—defined as the management of natural resources by the communities themselves or in conjunction with other stakeholders such as NGOs, government, and the private sector—is being viewed as a way of providing non-destructive management of protected areas (Hatton undated; Institute for Global Environmental Studies 2005; Mountain Institute 2000). Mclain and Jones (1997) suggest that local people often have a strong dedication to the wellbeing of their local ecology and possess an intimate knowledge of its socio-ecological particularities as reflected by the case of protected areas management. Increasingly, community-based tourism is being viewed as a way of providing non-destructive management of protected areas (Hatton undated; IGES 2005; Mountain Institute 2000). Tourism helps to stop deforestation and poaching since protected areas that are well maintained—that is, have rich flora and fauna—attract the most tourists, and the presence of people inside the protected area deters poachers and illegal loggers (Sawhney 1998, 2003). Local communities can provide many of the needed goods and services to visitors, and can, if integrated with the management of the natural areas, actively protect the natural resources of protected areas (Moisey 2002). Community-based tourism in protected areas can enhance local prosperity as it generates supplementary income and increases employment opportunities. Given a chance to benefit from tourism, and a say in its management, people living in or close to a protected area come to value it more and see that protection of the resource will provide sustained benefits for them (IGES 2005).

The CAMPFIRE program in Zimbabwe is based on a philosophy of sustainable rural development that enables rural communities to manage and benefit directly from local wildlife. The Zimbabwean government in 1981 passed an amendment to the existing law that enables districts and local communities to benefit from wildlife resources. CAMPFIRE re-empowers local communities by providing them with access to, control over, and responsibility for natural resources, asserting the right to make decisions regarding those natural resources and activities that affect them, and providing benefits to local communities from exploitation of natural resources (International Institute for Environment and Development 1994). The five main activities under the CAMPFIRE program are sustainable trophy hunting, sale of live animals, harvesting of natural resources, tourism, and sale of wildlife meat.

3. Approach and methodology

3.1. Research question and hypotheses

The main defining theme of this study was the observed international policy trend of the retreat of "big government"—that is strong state control of a wide range of issues from national down to local level—and the greater co-option of civil society into natural resource management. Seeing the increasing involvement of local communities and NGOs in the management of natural resources, this paper addresses the central research question, does people's participation in natural resource management reflect a genuine and permanent change in the role of the state?

While we cannot know the future, this study works on the assumption that for the change towards co-option of civil society into natural resource management to be permanent, participation must bring

genuine benefits for the government, the public, or both. The literature points to some likely areas of benefit. For governments, participation would bring attractive benefits if it reduced burdens on government. For communities, greater participation could allow them greater control and say in the management of their lives and environments. Thus the study tests two hypotheses:

Hypothesis 1: People's participation in natural resource management reduces demand on government resources.

Hypothesis 2: Participation leads to greater empowerment and mobilization of communities for effective natural resource management.

3.2. Data

Table 1. Details of the case studies used in the study on participation of civil society in management of natural resources

Subtheme	Case studies	Countries	Partner institutes
Promoting environmental education by NGOs	17	Indonesia, Japan	Indonesian Institute for Forest and Environment (RMI). Local research collaborators included: University of Indonesia, University of Gadjah Mada, Yayasan Sebahat Aqua, Ministry of Environment, Ministry of Education, Indonesia
Facilitating protected area management using community-based tourism	13	India, Indonesia, Japan, Thailand	Indonesian Ecotourism Network, Kasetsart University (Thailand),
Promoting local and indigenous knowledge-based sustainable resource management	16	Bangladesh, China (mainland and Hong Kong), Japan, Thailand	University of Hong Kong (China), Mahidol University (Thailand), National Institute for Environmental Studies (Japan), Bangladesh Resource Centre for Indigenous Knowledge, Centre for Natural Resources and Environmental Studies, Vietnam National University, Vietnam.

3.3. Analysis

The case studies were analyzed based on their individual content and then collectively, using a textual pattern-matching method as suggested by Yin (2002). The pattern matching identified and counted occurrences of some 540 variables that were expected to influence the success of an environmental policy. These were roughly divided into three groups: variables related to the different actors involved in the environmental policy and their roles and attitudes; variables related to the policy processes, such as formulation, implementation, evaluation, and revisions; and variables related to the content of the policy. The most significant patterns emerging from this exercise are included in the analysis below. A detailed description of the methodology used can be found in chapter 3 of this linked series of papers (King and Mori 2007).

4. Findings

4.1. Actor variables

The first set of variables studied in the textual pattern-matching exercise were related to the actors involved in the good practices and the roles they played. Selected results from the pattern matching on stakeholder and institutional actor variables are given in table 2. A large majority (85 percent) of the 46 case studies mentioned the involvement of stakeholders other than government, and a smaller majority (61 percent) mentioned the involvement of multiple stakeholders. This suggests that governments are increasingly involving non-government stakeholders in natural resource management and in sectors that were traditionally managed mainly by the government, such as education.

Table 2. Most frequently encountered stakeholder and institutional actor variables, as percentage of all case studies

Variables	Environmental education (n = 17) (%)	Community-based tourism (n = 13) (%)	LINK (n = 16) (%)	Total natural resource management cases (n = 46) (%)	All case studies (n = 139) (%)
2. Stakeholders	100	100	56	85	77
2.2. Civic engagement and public participation	100	100	50	83	75
2.2.1 Willingness to participate	100	100	50	83	73
2.2.1.3 Private-sector involvement	0	69	0	20	30.2
2.2.1.6 Formal public-private partnerships	35	85	0	37	24
2.2.1.7 Networking	100	46	6	52	33.1
2.2.1.9 Multiple stakeholders	88	46	44	61	37
3. Institutional factors	100	100	56	85	91
3.4 Funding source	53	92	38	59	68
3.4.1 National government	0	69	6	22	27
3.4.2 External sources	29	38	25	22	28
3.4.3 Local government	0	31	13	13	22
3.4.4 Private sector	12	15	19	30	35
3.4.5 User pays	0	6	0	13	21

Note: LINK = Local and indigenous knowledge-based sustainable resource management.

Of the 46 cases analyzed, 33 case studies had some element of people's participation in natural resource management. This varied from involvement in management of tourism activities in protected areas, coastal resource management, forest management, or forest regeneration projects to promoting environmental awareness and changing people's attitude and perception towards the environment and natural resource management. Thus, not surprisingly, governments are entering into partnerships with

the other stakeholders (37 percent of cases) and forging networks (52 percent) for carrying out development activities.

In the case of community-based tourism, governments have involved both the local people and the private sector in operating tourism activities, saving the government costs related to tourism management and for patrolling and controlling illicit activities inside the protected areas. Once given a stake with clearly defined roles and a share of the profits in tourism and protected-area management, people are willing to help in maintaining the areas' resources and in stopping others from damaging them. In the case of ecotourism in Ban Khao Lek village at Chalerm Rattanakosin National Park, Thailand, a joint management committee was set up between the park and the local people as a government pilot project for co-management of the park's resources. The committee created a communication platform between the park authorities and the local people, which helped to enlist local people's cooperation in the conservation of park resources.

Table 3. Most frequently encountered process variables, as percentage of all case studies

Variables	Environmental education (n = 17) (%)	Community-based tourism (n = 13) (%)	LINK (n = 16) (%)	Total natural resource management cases (n = 46) (%)	All case studies (n = 139) (%)
4. Policy formulation process	6	8	88	52	78
4.2 Formulation phase	0	69	75	46	65
4.2.7 Screening of policy impacts	0	15	0	4	21
6. Policy implementation	6	100	50	48	79
6.6 Ease of implementation	0	62	19	24	47
6.6.4 Technical support for implementation	0	62	19	24	40
6.6.4.1 Capacity strengthening	0	38	19	17	24
6.6.4.2 Awareness raising	0	54	0	15	32

Note: LINK = Local and indigenous knowledge-based sustainable resource management.

Table 4. Most frequently encountered policy content variables, as percentage of all case studies

Variables	Environmental education (n = 17) (%)	Community-based tourism (n = 13) (%)	LINK (n = 16) (%)	Total natural resource management cases (n = 46) (%)	All case studies (n = 139) (%)
8. Policy content	24	100	56	57	78
8.1 Command and control	0	69	0	20	34
8.1.4 Permits and restrictions	0	62	0	17	25
8.2 Market-based instruments	0	77	0	22	48
8.2.1 Aimed at producer behavior	0	54	0	15	32
8.6 Creation of new markets	6	92	25	37	29
8.6.2 Facilitating market creation	0	62	0	17	14

Note: LINK = Local and indigenous knowledge-based sustainable resource management.

The good practice on coastal marine resources and security of the poor and landless in Bang Khunsai and Ban Laem, Thailand, was a good example of how people can organize themselves into associations for the protection of natural resources on which their livelihoods depend and thus successfully protect the resources from overexploitation while continuing to generate income from them for the local communities.

As for funding, the cases illustrated that resource conservation efforts do not always require government funding. Of the cases analyzed, only 22 percent had government funding (mostly community-based tourism cases). In the rest, NGOs and communities used their own labor and funds for the management of environmental resources. Most of the cases studies in environmental education illustrated that NGOs used their own funds or funds from international organizations to support their activities, while none of the cases indicated receipt of funding from the national or the local government. In the case of a wetland in Hong Kong, World Wildlife Fund Hong Kong, with the consent of the government, took over active management of the site and implemented a preservation program (Lee 2003). In the LINK cases, activities were carried out by the people themselves or with external assistance from source other than the government. In some cases people were willing to pay for reviving and maintaining sustainable practices, as in the case of Shishitsuka-oike pond, Ibaraki, Japan, where local people started growing rice organically in abandoned paddies and then marketing it (Aoyagi 2004).

4.2. Process variables

The occurrence of the most frequently encountered process variables is shown in table 3. Compared to all the cases analyzed under the RISPO project, the cases analyzed in this paper reflect less attention being given to policy formulation (52 percent) and policy implementation (48 percent), implying a greater need on the part of governments to promote stakeholder participation in natural resource management. Analysis of the different steps involved in the policy formulation process reveals very little attention being paid to policy formulation processes and screening of potential policy impacts,

suggesting the need for more careful weighing of options before proceeding. Overall, there is evidently a need for additional attention to be paid to the formulation, implementation, and screening processes in order to increase the chances of policies aimed at encouraging people's participation being successful .

4.3. Policy content variables

The occurrence of the most frequently occurring policy content variables is shown in table 4. A surprising feature is the contrast between the policy measures adopted in environmental education and those adopted in the area of community-based tourism. Command-and-control measures predominate in community-based tourism, while the cases in environmental education reflect a complete lack of such measures. This points to the potential for intervention by stakeholders other than government in natural resource management, especially related to community-based tourism. On the other hand, more intervention by government in LINK and environmental education could provide NGOs and local communities with incentives to strengthen their role in natural resource management.

Market factors are becoming increasingly important with local people's growing involvement in resource management. Market-based instruments (77 percent of all cases) and creation of new markets (92 percent) appeared frequently in the cases of community-based tourism. Promotion of tourism provides financial benefits to people living in and around protected areas, helps in preventing conflicts, and also leads to better protection and monitoring. People have helped in reporting illegal encroachment and in garbage collection in the protected areas and have an opportunity to participate in tourism activities. In developing countries, the government usually does not have enough resources or manpower to monitor and patrol protected areas sufficiently. Thus local people's involvement provides dual benefits, both to the government and to the local people.

5. Conclusions

Multiple stakeholder involvement in natural resource management has been strongly promoted over the last few decades. One reason for this is that experience has shown that natural resources cannot be managed by the government or the local people acting alone. The cases analyzed in this study illustrate the growing trend of multi-stakeholder participation. The cases also reflect that in a few places participation has replaced the traditional role of the government. In the environmental education cases, NGOs had not only used their own resources but had also provided vital training to the local people and to government officials on the importance of protecting the environment and natural resources. In the case of community-based tourism and LINK, the good practice case studies reflected that participation had worked: local communities' involvement had resulted in better management of resources. Though not going all the way, the public participation analyzed in this study had proved to be resource-efficient for the government and thus supported hypothesis 1, that "People's participation in natural resource management reduces demand on government resources."

On the other hand, local people's involvement in a policy, plan, program, or project gives them a greater sense of ownership of the process and its outcomes. Agreements are always likely to be more sustainable if they emerge from wider understanding and a genuine sense of ownership. This reduces the risk of subsequent conflict, damage, and resistance (Interact undated). The good practices in the areas of

LINK and community-based tourism confirmed that when given a stake in the management of resources, people tend to manage them much better, either by sharing the government's responsibility or by taking over the government's role entirely. Though legal transfer of rights has not taken place in community-based tourism and the control still rests with governments, governments have provided room for people to express their opinions and to get involved in tourism and management activities, thus supporting hypothesis 2, that "participation leads to greater empowerment and mobilization of communities for effective natural resource management."

Thus participation not only improves governments' resource efficiency but also helps in building trust between the government and the public and in giving people more say in regulating and managing resources. For developing countries, where people still depend largely on natural resources for their livelihoods, participation helps in building synergies between the different actors and can be effective in sustainable management of resources. Despite some cases of failures of policies related to participatory natural resource management, the findings from this study should encourage governments to consider other areas where they could involve people in natural resource management, including coastal resource management and production forestry.

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Best Practice on Environmental Policy in Asia and the Pacific: Chapter 8

Lessons, Conclusions, and Recommendations from the RISPO Good Practice Case Studies

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Environmental policymakers in developing countries, including those of the Asia-Pacific region, often face a tough dilemma. They realize that formulating good policy requires careful consideration of various options to arrive at policies that are well suited to the particular circumstances of their country or area, but can still achieve the desired end. At the same time, they are subject to significant pressure, both domestic and international, to define and implement policies quickly. The Institute for Global Environmental Strategies (IGES) has been gathering and analyzing case studies of good environmental policy practices, with a strong focus on the Asia-Pacific region, in order to help policymakers make better policy decisions based on the experiences of others facing similar challenges. This paper completes the series of eight linked papers presented in this special issue of the *International Review for Environmental Strategies.* Based on the analyses in the preceding papers and on a textual pattern-matching exercise carried out on the whole database of good practice case studies gathered under the Research on Innovative and Strategic Policy Options (RISPO) project, this paper makes recommendations and draws lessons and conclusions for environmental policymakers.

Keywords: environmental policy, good practices, lessons learned, recommendations

1. Introduction

Modern environmental policy is an essential tool in moving towards sustainable development. For developing countries in Asia-Pacific, however, selection of the most appropriate policies is no longer as simple as copying policies previously adopted in developed countries. There is ample evidence that environmental policy must be carefully matched to current economic, social, political, and cultural conditions—plus institutional capacities—for it to be effective. Unfortunately, few nations appear to have any formal comprehensive policy-appraisal system in place that would help to avoid selecting inappropriate policy instruments.

Between 2002 and 2005, the Institute for Global Environmental Strategies (IGES) led an Asia-Pacific-wide research project in collaboration with several other institutes, called Research on Innovative and Strategic Policy Options (RISPO), to gain a better understanding of how developing countries in Asia and the Pacific have approached environmental policy choices. Through this study, IGES developed and

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Table 1. Environmental policy trends and subthemes for the RISPO good practice case studies

Policy trends	Subthemes
Accelerating the societal shift to a post-fossil fuel era.	Innovative finance for renewable energy development.
	Promotion of biomass energy use.
Finding material and energy-efficiency gains outside major industries.	Inter-boundary recycling market for promoting a resource-recycling society
	Improving environmental performance of small and medium enterprises
Orienting urban life to ecological principles.	Development of environmentally sustainable transport systems in urban areas
Retreat of "big" government and co-option of civil society into natural resource management.	Promoting environmental education by NGOs
	Facilitating protected-area managementusing community-based tourism
	Promoting sustainable resource management based on local/indigenous knowledge

currently maintains two online knowledge-based tools—the Good Practices Inventory and Strategic Policy Options—in the expectation that policymakers in developing countries of Asia and the Pacific will find the experience of other countries useful when drawing up their own policies. More information about RISPO and the data collection methods for the Good Practices Inventory can be found in chapter 3 of this series of linked chapters. (King and Mori 2007).

As the objective of the research was to uncover innovative policies and policy instruments as well as cases of well-known policies being applied in new settings, the case studies and policy options were collected under eight subthemes that are at the cutting edge of policy development trends in Asia and the Pacific and were thought to be likely to demonstrate innovative approaches and policy instruments. As well as presenting the good practices and the strategic policy options in database form, it was decided to carry out further research to find out what patterns could be found and what lessons these might yield for policymakers in developing countries, especially in Asia and the Pacific.

The findings of the studies into the four main policy trends—accelerating the societal shift to a post-fossil fuel era; finding material and energy-efficiency gains outside major industries; orienting urban life to ecological principles; and retreat of "big" government and co-option of civil society into natural resource management—are presented in the previous chapters in the linked series of papers in this special issue of the *International Review for Environmental Strategies* (Ogihara, Gueye, King, and Mori 2007; Takahashi, Hashi, King, and Mori 2007; Matsumoto, King, and Mori 2007; Sawhney, Kobayashi, Takahashi, King, and Mori 2007).

This is the final paper in the series and presents the findings from applying textual pattern-matching analysis to all of the good practices examined in the research exercise. On the basis of this it draws conclusions and makes recommendations for environmental policymakers.

2. Approach and methodology

2.1. Research hypotheses

A review of the evolution and diffusion of environmental policy over the past 30–40 years leads to the following hypotheses, which were tested in the research:

Hypothesis 1: Innovative environmental policies emerged in response to increasing recognition of the interaction between environment and other sectors, but only as particular problems were identified and governments were pressured to react by concerned stakeholders.

Hypothesis 2: Although there has been relatively little innovation in the formulation of environmental policies in developing countries compared with the developed countries, they have shown much more innovation and diversity in policy implementation, reflecting particular national circumstances.

Hypothesis 3: Environmental policy innovation in developing countries of Asia and the Pacific, in the few cases where it has emerged, has built on unique cultural and social characteristics.

Hypothesis 4: Lack of a supportive policy framework and suitable market conditions act as impediments to environmental policy innovation and adaptation.

2.2. Methodology

This study combines the findings of the 139 good practice case studies under all of the environmental policy trends and policy subthemes (see table 1). A textual pattern-matching technique was applied to all of the case studies to find the aggregate frequency of occurrence of 540 "success factors"—factors believed likely to affect the success of environmental policies—which were identified by the RISPO researchers based on the literature review. It was assumed that those factors that occurred in a large proportion of the case studies were more likely to be important for the success of the policy. The findings of this analysis were analyzed alongside the findings of the other thematic studies presented in this series, in order to answer the research question and hypotheses and to draw conclusions and recommendations for environmental policymakers in Asia and the Pacific. A full description of the methodology used in the study can be found in chapter 3 of this linked series of papers (King and Mori 2007). All of the case studies can be found in the RISPO Good Practices Inventory (http://www.iges.or.jp/APEIS/RISPO/inventory/db/index.html).

3. Textual pattern-matching

From the frequency analysis, observations were drawn regarding the most common explanatory variables, across all 139 cases, across countries, and across subthemes. On average, about 33 explanatory variables were recorded per case (figure 2). The cases in the policy subtheme "innovative finance for renewable energy development" showed the largest number of "success" factors, while "promoting sustainable resource management based on local/ indigenous knowledge" and "promoting environmental education by NGOs" showed the fewest (figure 1).

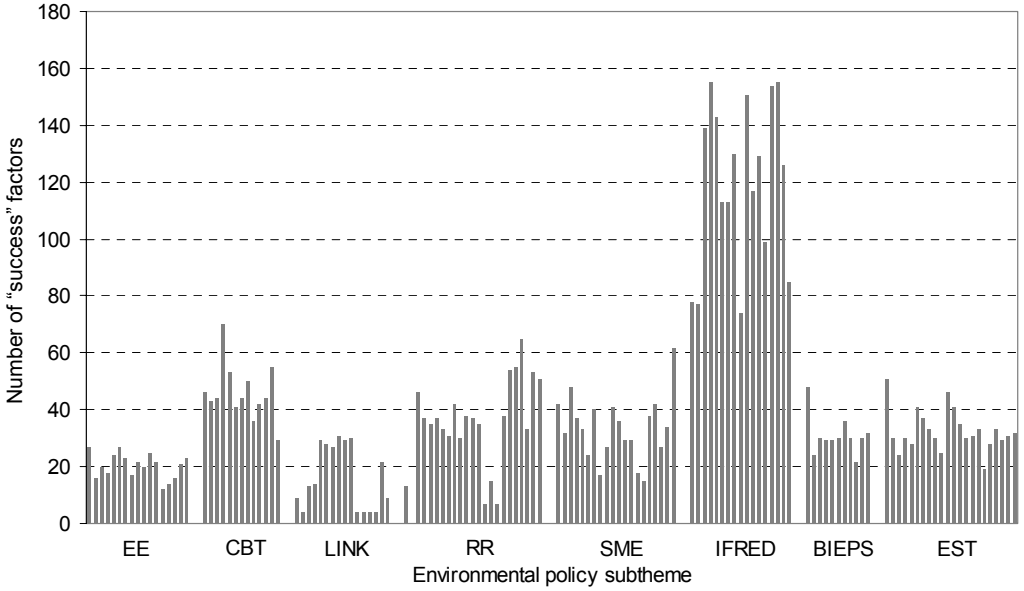

Figure 1. Numbers of "success" factors found in case studies, by policy subtheme

Note: EE = promoting environmental education by NGOs; CBT = facilitating protected-area management using community-based tourism; LINK = promoting sustainable resource management based on local/indigenous knowledge; RR = inter-boundary recycling market for promoting a resource-recycling society; SME = improving environmental performance of small and medium enterprises; IFRED = innovative finance for renewable energy development; BIEPS = promotion of biomass energy use; EST = development of environmentally sustainable transport systems in urban areas.

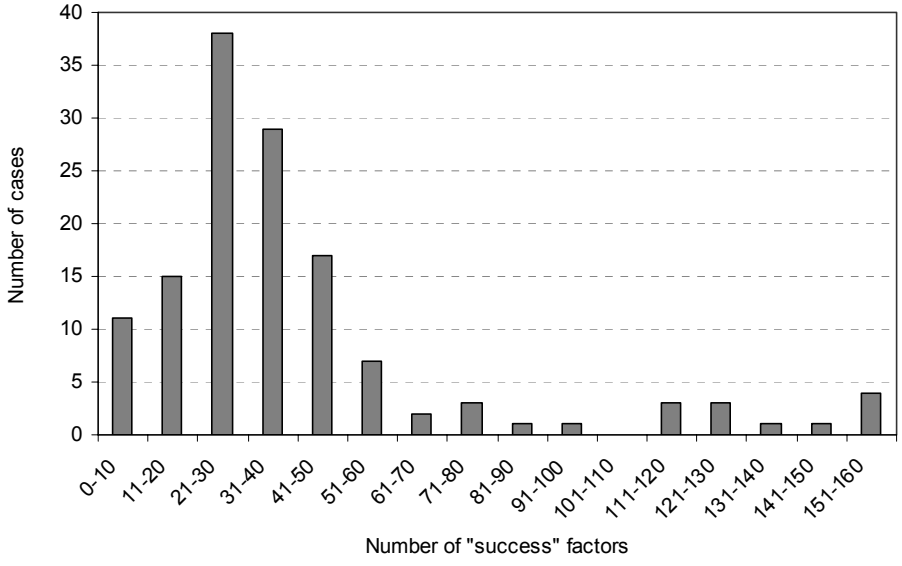

Figure 2. Numbers of "success" factors found in case studies, by number of case studies

Table 2. Selected "actor" success variables, as percentage of all case studies in the RISPO Good Practices Inventory

Variable	Policy trend 1 post-fossil fuel era (n = 28) (%)	Policy trend 2 resource efficiency (n = 43) (%)	Policy trend 3 urban ecology (n = 22) (%)	Policy trend 4 co-option of civil society (n = 46) (%)	Total cases (n = 139) (%)
1. Political factors	17.9	11.6	4.5	13.0	12.2
2. Stakeholders	92.9	79.1	36.4	84.8	77.0
2.2 Civic engagement	92.9	74.4	36.4	82.6	74.8
2.2.1.5 Active NGOs	7.1	4.7	0.0	45.7	18.0
2.2.1.7 Networking	7.1	46.5	0.0	52.2	33.1
2.2.1.9 Multiple stakeholders	64.3	11.6	0.0	60.9	36.7
2.2.1.3 Private sector	75.0	27.9	0.0	19.6	30.2
3. Institutional factors	100.0	88.4	100.0	84.8	91.4
3.4 Funding	85.7	55.8	90.9	58.7	68.3
3.10 Private/public sector cooperation	25.0	58.1	59.1	30.0	36.0
3.7 Civil society organizations and non-governmental organizations	14.3	18.6	22.7	67.4	34.5
3.6 Consultants/researchers/ think tanks	28.6	30.2	40.9	26.1	30.2
3.3 Sub-national/local government.	42.9	7.0	86.4	13.0	25.2
3.4.1 National government	42.9	27.9	18.2	21.7	27.3

3.1. Actor variables

The first set of success variables that were examined were concerned with actors involved in policy processes. The variables occurring most frequently in the full RISPO Good Practice database are shown in table 2, expressed as the percentage of the cases in the database in which each variable occurred.

Lack of political will is often cited as a major obstacle for successful environmental policy implementation. It was therefore surprising that relatively few of the good practice cases (12.2 percent) noted the role of politicians or even the importance of a democratic political system. Evidently the involvement of non-government stakeholders has made a much more important contribution overall, occurring in more than 80 percent of cases in three out of four of the policy trend areas (the exception being the area of sustainable urban transport). In relation to institutions, apart from the clear importance of adequate funding to most of the cases, four groups—the private sector; civil society organizations and non-governmental organizations (NGOs); consultants, researchers, and think tanks; and local and national governments—all ranked roughly alike in importance, with some variance across the groups.

Table 3. Most frequently encountered "process" variables, as percentages of all case studies in the RISPO Good Practices Inventory

Variable	Policy trend 1 post-fossil fuel era (n = 28) (%)	Policy trend 2 resource efficiency (n = 43) (%)	Policy trend 3 urban ecology (n = 22) (%)	Policy trend 4 co-option of civil society (n = 46) (%)	Total cases (n = 139) (%)
4. Policy formulation process	92.9	83.7	100.0	52.2	77.7
4.1 Preparation phase	71.4	58.1	100.0	4.3	49.6
4.1.1 Setting goals and objectives	50.0	25.6	100.0	4.3	35.3
4.2 Formulation phase	89.3	74.4	54.5	45.7	64.7
5. Linkages with other policy levels	46.4	25.6	18.2	30.4	32.4
6. Policy implementation	100.0	88.4	100.0	47.8	79.1
6.6.4 Technical support	39.3	76.7	4.5	23.9	40.3
7. Progress monitoring and policy revision	67.9	34.9	18.2	32.6	38.1

Table 4. Most frequently encountered "content" variables, as percentages of all case studies in the RISPO Good Practices Inventory

Variable	Policy trend 1 post-fossil fuel era (n = 28) (%)	Policy trend 2 resource efficiency (n = 43) (%)	Policy trend 3 urban ecology (n = 22) (%)	Policy trend 4 co-option of civil society (n = 46) (%)	Total cases (n = 139) (%)
8.1 Command-and-control type	50.0	39.5	19.6	35.7	33.8
8.2 Market-based instruments	54.5	51.2	21.7	82.1	48.2
8.3 Voluntary agreements	0.0	53.5	32.6	10.7	29.5
8.4 Informational regulation	4.5	25.6	13.0	17.9	16.5
8.5 Direct intervention	50.0	7.0	2.2	21.4	15.1
8.6 Creation of new markets	0.0	27.9	37.0	39.3	28.8

Most of this variance can be explained by the policy trends selected; for example, one would expect that civil society organizations and NGOs to be important under policy trend 4 (retreat of "big government" and co-option of civil society into natural resource management), and local government to be important to policy trend 3 (orienting urban life to ecological principles).

Some of the least frequently mentioned actor variables were green political parties (0 percent), constitutional provisions (0 percent), and democratic traditions (1.4 percent). While these actor variables would presumably assist in creating a supportive political environment, clearly good practices in the environmental domain need not wait for them to emerge. In addition, it is often asserted that conflicting groups should be brought into the decision-making process because if they are not engaged they can

undermine good work done by others. In the 139 cases examined, there was barely any mention of negotiated agreements on policies (0 percent), conflicting groups (2.9 percent), or conflict (7.2 percent). Where conflict had been successfully mediated, the principal actors were the judiciary and domestic interest groups.

3.2. Processes

The most frequent set of process variables is summarized in table 3. As the good practice cases were intended to focus on policy implementation, it was surprising that the pattern matching identified a relatively large number of cases where the importance of policy preparation and formulation processes was noted.

Table 3 also shows that one of the most important factors for implementation was the availability of technical support. Where funding comes partly from an external source, the technical support is likely to be from consultants or other policy entrepreneurs, who learn by doing and then transfer their policy experience to new situations.

It is also important to note the surprising absence of some success factors that a review of the literature on policymaking might suggest would feature. For example, there was hardly any evidence of modeling or scientific research as a precursor to policy formulation. Scenario planning was used in only two cases, and there was little documentation of the policies, either in legal form or in plain language. This suggests that even today in developing countries policies are adopted without sufficient heed to the potentially negative consequences of direct policy transfer from developed countries. It also suggests that additional research needs to be undertaken on how policymakers in Asia actually carry out their job. Finally, it serves as a warning that recommendations for the introduction of more formal, systematic policy-appraisal mechanisms may not find much support.

3.3. Policy content

Table 4 summarizes the most frequently encountered policy content variables from the 139 cases in the database. The case studies demonstrate the importance of policy mixes in best practice examples. Although the policymakers' intention may have been to introduce one of the new generation of environmental policy initiatives, frequently the threat, or the reality, of the introduction of command-and-control measures tips the balance towards successful outcomes. Possibly the newest form of policy content, "informational regulation", where the provision of environmental information to the public is made mandatory, has yet to have its full impact and may be expected to grow in popularity in the near future.

There appears to be little significant difference in the frequency of occurrence of success factors in the different regional groupings used in the analysis (see table 5). Although the number of cases from Europe was quite low, they tended to represent the new "soft" environmental policy initiatives, with a less heavy hand from government (although this may represent bias in the selection of cases). Among the most marked differences found was that the involvement of political leaders in policy decisions appears to be more dominant in Europe than in Asia-Pacific. This could reflect greater political transparency in Europe rather than diminished engagement in the Asia-Pacific region.

Table 5. Most commonly encountered variables by country group, as percentages of all case studies in the RISPO Good Practices Inventory

	Country groups				
Variable	Developing Asia (%)	Industrialized Asia (%)	Latin America (%)	Europe (%)	All (%)
Actors					
1. Political factors	10	8	50	100	12
2. Stakeholder factors	76	83	75	100	77
3. Institutional factors	90	100	100	100	91
Policy processes					
4.1 Policy preparation	47	50	100	100	50
4.2 Policy formulation	78	67	100	100	78
5. Linkages with other policy levels	33	33	25	0	32
6. Policy implementation	78	92	100	50	79
7. Progress monitoring and policy revision	38	32	25	100	38
Content					
8.1 Command-and-control type	32	50	25	50	34
8.2 Market-based instruments	44	75	75	100	48
8.3 Voluntary agreements	30	25	0	100	29
8.4 Informational regulation	15	25	0	100	17
8.5 Direct intervention	12	25	100	0	15
8.6 Creation of new markets	29	25	25	50	29

The lack of significant differences between different regional groupings suggests that environmental policy may be regarded as a near-universal domain, and that the decades of summits and global agreements and treaties on sustainable development and management of the global commons have raised awareness sufficiently to erase the suspicions and differences between South and North that existed in the 1970s. If this is true, then one can expect increased transfer of environmental policies from South to North as well as in the opposite direction, as has been proved to some extent in the good practices related to sustainable transport

Another factor that may have influenced the adoption of new environmental policies by developing countries is globalization. Globalization influences policymakers in two ways. First, the pace of global communication has accelerated, especially with the revolution in information technology and the availability of information on the Internet. Second, companies from developed countries locating production facilities in the developing world bring with them best practice technology plus internal policies that prevent them from behaving differently in different countries. They demand a level playing field to avoid competition from domestic companies and insist that companies in their direct supply chain follow the same environmental practices, often providing technical assistance to implement the changes.

4. Conclusions, lessons, and recommendations

4.1. Review of the initial hypotheses

Returning to our starting hypotheses for the whole study, for the first hypothesis, "innovative environmental policies emerged in response to increasing recognition of the interaction between environment and other sectors, but only as particular problems were identified and governments were pressured to react by concerned stakeholders," the breadth of sectors covered by environmental policies in Asia and the Pacific is revealed by the wide range of cases studied, from management of common property resources in remote rural areas to sophisticated urban transportation solutions. A few of the case studies suggested that policies were being implemented in response to pressure exerted by concerned external parties, especially by NGOs and donor agencies.

For hypothesis 2, "although there has been relatively little innovation in the formulation of environmental policies in developing countries compared with the developed countries, they have shown much more innovation and diversity in policy implementation, reflecting particular national circumstances," the very high ranking of policy implementation across all policy dimensions, with the possible exception of policy trend 4 (retreat of "big" government and co-option of civil society into natural resource management), would suggest that innovation in implementation is a significant factor in the apparent success of these cases. However, the importance of technical support during implementation, often from outside the region, suggests that the source of innovation was not necessarily home-grown.

The importance of unique cultural and social characteristics asserted in hypothesis 3, "environmental policy innovation in developing countries of Asia and the Pacific, in the few cases where it has emerged, has built on unique cultural and social characteristics," appears not to be confirmed by the evidence. Only one case mentioned the importance of cultural factors and there was no mention at all of racial or religious similarities being a factor. The literature on policy transfer suggests that ideas and lessons learned are gleaned from other countries, within the country, or locally (Dolowitz and Marsh 2000), and provided there is sufficient similarity in the circumstances demanding a policy response, then cultural and social differences may be ignored. One word of caution, however, is that policy failures often occur when international policy entrepreneurs blithely transfer policies from one setting to another, without sufficient analysis of how comparable the different settings really are. For example, consultants may move from one assignment to another, using the same policy prescriptions without an in-depth understanding of the nuances of each setting.

For hypothesis 4, "lack of a supportive policy framework and suitable market conditions act as impediments for policy innovation and adaptation," the cases studied by Ogihara, Gueye, King, and Mori (2007) under the policy trend "accelerating the societal shift to a post-fossil fuel era" clearly indicated the potential and desirability of promoting renewable energy in the future, but also outlined the current lack of an adequate infrastructure and the political will to implement renewable-energy-related policies in the region.

4.2. Lessons and recommendations for environmental policymaking

Some of the key findings from this research are as follows.

Political will and suitable market conditions are important to promote and formulate innovative environmental policies. In most cases outlined in the analysis, the enabling environment for policy innovation was lacking.

Environmental policy is undergoing rapid changes. These changes have major implications for decision makers in developing countries of Asia and the Pacific. If we understand environmental policies as "a set of principles and intentions used to guide decision making about human management of environmental capital and environmental services" (Roberts 2004), decision-makers in the region need to re-examine their principles and intentions. Governments throughout the region have signed a wide range of global and regional environmental agreements and treaties. Many of the principles that underpin these agreements form the basis of emerging "soft" law on environmental management at the global level. There is an expectation that developing countries will embody these principles through legislation and firm environmental policy at the national and sub-national levels, and properly enforce them.

In particular, the widespread belief that environmental quality inevitably takes a turn for the worse as a country expands economically needs to be carefully questioned. There is now emerging consensus that this observed phenomenon is due to slow response capacity in rapidly growing economies rather than some immutable natural law. There is no need to take a "grow now, clean up later" position, as countries may actually achieve "first-mover" advantage if they are in the forefront of innovative environmental policies. There is plenty of potential to leapfrog outmoded approaches, because most of the infrastructure and physical assets that will underpin the region's future economic growth have yet to be constructed. Policy choices that direct manufacturers and consumers towards resource efficiency and recycling are an inevitable outcome of the realization that not all countries can expect to be as profligate as the US and Europe have been.

> A break-through—a mental leapfrog—is what the South most lacks. The most adverse impact of the current industrial growth model is that it has turned the planners of the South into cabbages: believing it has no answers; only problems, for which the solutions lie in the tried and tested answers of the rich world (Narain 2006).

Throughout the environmental policy changes of the 1970s and 1980s, developing countries in Asia and the Pacific looked to developed countries as a convenient shortcut to policy formulation and institutional models. Policy transfer and policy diffusion processes have been shown by this research project to remain important learning mechanisms in Asia and the Pacific. North–South policy transfer is not the only direction for environmental policies, however, as shown in chapter 6. Policymakers are advised to (i) consider developing innovative environmental policies that are based on unique cultural and social characteristics of the country concerned; and (ii) look to other developing countries in other regions for valuable experience. Similarly, developed countries should not ignore experience in innovative environmental policies in developing countries in Asia and the Pacific.

Across the four cutting-edge trends in environmental policy development in Asia and the Pacific (accelerating the societal shift to a post-fossil fuel era; finding material and energy-efficiency gains outside major industries; orienting urban life to ecological principles; and retreat of "big" government and co-option of civil society into natural resource management), some clear success factors are held in common. In general, hypotheses related to the emerging importance of stakeholder involvement in decision-making were confirmed. For renewable energy, CSOs and NGOs have been important advocates in policies related to finding alternatives to fossil fuels, while the private sector and consumers have been important actors during implementation (Ogihara, Gueye, King, and Mori 2007). In relation to resource efficiency and recycling, private sector and local community initiatives have been in the lead rather than government policy (Takahashi, Hashi, King, and Mori 2007). In the policy transfer cases for sustainable transport, the important role of international organizations was highlighted, along with concerns that this role should be supportive rather than coercive (Matsumoto, King, and Mori 2007). In the final group of cases related to co-option of civil society, in many countries the state has started delegating responsibility to local communities, recognizing its own limitations in taking sole responsibility for management of protected areas and other important natural resources (Sawhney, Kobayashi, Takahashi, King, and Mori 2007). All of these studies tend to reveal governments as rather passive or reactive actors in finding innovative policy solutions for cutting edge problems. There is certainly plenty of space for governments in developing countries of the Asia-Pacific region to take a more proactive role in all modern environmental issues.

In relation to policy processes, emphasis seems to be placed on policy formulation and implementation. In all cases there was little attention paid to extensive preparation, including detailed research into policy alternatives, and in no case was there adequate attention to post-implementation issues such as sunset clauses, monitoring, and policy revision. If there is to be continuous improvement in policy processes then both ends of the policy cycle need increased attention. As shown in the renewable energy cases, even voluntary policy instruments are enhanced by setting clear goals and quantitative targets. Targets that are binding on industry sectors but flexible enough to allow the industries concerned to find workable solutions appear to be much more effective than governments trying to micro-manage industry choices. Assisting with technology transfer and seed funding appear to be necessary to kick start innovative renewable energy technologies, as traditional fossil fuels still carry "unfair" advantages, such as government-funded grid systems. However, governments can start with off-grid areas in developing countries, which will enable testing of technologies and economies of scale. As the renewable energy technologies become more competitive they can then tackle the fossil fuel technologies on a slightly more level playing field.

The resource efficiency and recycling cases also showed the importance of government assistance in strengthening existing markets and networks—where necessary by direct provision of facilities—such as industrial parks practising industrial ecology and advanced recycling systems. Government procurement systems for green products can also kick-start new markets for recycled and reused goods.

The environmentally sustainable transport cases illustrated the importance of political leadership, especially at the local government level, and the potential for political leaders to form close alliances across regions and share experiences. Contrary to normal expectations, these cases also demonstrated

the potential for innovative policies to originate in developing countries, suggesting that policymakers should look more broadly when considering policy transfers (Matsumoto, King, and Mori 2007). Countries with similar recent development experience may be better sources of innovative policies than developed countries with very different social and economic histories.

The linked chapter on civil society highlights how increased participation by stakeholders, governments, local and indigenous people, NGOs, and the private sector in natural resource management in Asia results in greater resource efficiency (Sawhney, Kobayashi, Takahashi, King, and Mori 2007). It also contributes to broader devolution of power and reflects the changing attitude of governments towards people's participation. The findings provide encouragement to governments to extend community management of natural resources to other ecosystems, such as coastal fisheries or production forests.

As expected, all cases showed evidence of the new environmental policy instruments, such as voluntary agreements and market creation. What was unexpected was the continued prevalence of command-and-control regulations. It seems that the reality or threat of traditional command-and-control regulations backs up or underpins successful application of the new environmental policy instruments. An interesting area for additional research would be to investigate cases of policy failure to determine if unsuccessful application of new environmental policy instruments was due to the complete absence of command-and-control measures.

4.3. Learning and recommendations for environmental policy research

There is widespread evidence from the case studies examined by RISPO that countries in Asia and the Pacific rarely engage in the necessary level of investigation and research before adopting environmental policies. Accordingly, the knowledge gained through the RISPO project, where some 139 good practice cases have been thoroughly researched, needs to be expanded and kept up to date, but should assist policymakers. For an analysis of this research see King and Mori (2007).

Good practices are important heuristic devices for policymakers in developing countries. Practices that are demonstrated to work in other developing countries are much more useful than trying to adapt environmental policies and instruments from dissimilar conditions in developed countries. Extracting lessons across the range of good practices promises even more value than can be gauged from a single case, as there may be some success factors in common that should be replicated elsewhere.

Overall, the research methodology employed tended to reinforce existing knowledge rather than generating new insights. For future research it would be interesting to contrast successful and unsuccessful applications of the same policy instruments. Absence of the success factors revealed by this research in unsuccessful cases would tend to confirm their importance, thus providing policymakers with important information on how to create better enabling environments for successful application of innovative policies.

One of the unique insights revealed by the research that policy analysts have overlooked is the possibility of policy transfer from developing countries to both other developing countries and to

developed countries. Additional research should be carried out in areas other than environmentally sustainable transport to determine how widespread this phenomenon is.

The research demonstrates that collecting case studies representing best practice can go beyond the passive approach of entering those studies into an online database. Through qualitative research methodologies conducted by RISPO, valuable findings have been revealed that suggest improved ways to think about policy formulation, analysis, and transfer. As suggested in chapter 6, there may be value in conducting similar analysis of policies that have failed, as lessons can be drawn from failures as well as successes. The good practices analyzed in chapter 7 reflect the successful cases of people's participation in natural resource management. However, it would be interesting to look at cases where participation has failed in order to draw more comprehensive and policy relevant lessons for promoting joint management of resources. Combining success and failure factors would then provide useful inputs to policymakers throughout the Asia-Pacific region.

A missing dimension of the research was the actual motivations and thought processes of the various actors. It would be useful to understand why certain actors, such as industry leaders, have taken leadership positions in relation to innovative policies. Additional research, including structured interviews with key stakeholders, would provide important insights into why some policies have worked and others have not. Such insights would provide material for awareness raising, technical assistance, and education programs aimed at changing specific motivations and behaviors.

Finally, it is clear that there are important lessons to be learned by cross-group comparisons. Policy analysts, think tanks, and researchers providing inputs to policymakers should consider looking at domains and sectors outside their area of interest, as there may be useful lessons to be gained from environmental policies implemented in unrelated areas.

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Essay

The Challenges of Tsunami Disaster Response Planning and Management

Amado S. Tolentino Jr.[a]

No natural disaster in recent history has affected so many people's lives as the December 2004 Indian Ocean tsunami. The world's response in the wake of the tsunami seems so far to have revolved around recognition of the need for early warning systems linking countries and regions that are likely to be affected by the same tsunami or similar disasters. This paper introduces the main international initiatives for tsunami disaster response, and particularly for early warning. It then suggests some priorities for the current tsunami response planning and management efforts: (1) there should be no early warning systems without national actions plans; (2) there should be investment in preparing communities at risk; (3) tsunami early warning should be integrated into a multi-hazard system that also covers floods, storms, droughts, and other less frequent events; (4) there should be more cooperation with development banks to mainstream disaster management in countries that show willingness and commitment; and (5) the international community must not overlook other disasters such as famine and disease outbreaks in its haste to respond to the tsunami. Finally the paper argues that to undertake comprehensive tsunami response planning and management, there is a need for an approach that is grounded in both past evidence and present realities.

Keywords: tsunami, disaster response, early warning systems

1. Introduction

No natural disaster in recent history has affected so many people's lives as the Indian Ocean tsunami of December 26, 2004. Originating in an earthquake in the sea off Sumatra, Indonesia, the tsunami devastated coastal areas and killed at least 226,000 people in 12 countries, some as far away as Africa's east coast.

Within hours of the tragedy, people were attempting to apportion blame for the devastation and human tragedy wrought by the tsunami, which still occurred even though several hours elapsed before the waves reached some countries (Sainath 2005). Adequately functioning emergency plans were found to exist nowhere. Even when warnings were issued, the standing response plans and drills meant little, because they had not been practiced.

Normally, generating interest in disaster response planning and management is difficult. However, after the tragic events of December 2004 the international media propelled tsunami disaster relief to the top of its agenda. Four initiatives at a total cost of US$100 million have been announced including one for India with a budget of $27.5 million. The debates on early warning systems, however, focused on

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technology to the exclusion of the equally important issues of capacity building, security, and environmental planning. Even in areas not affected by the tsunami, experts now see now opportunities particularly in the areas of improvement of disaster prevention, creation of a "culture of resilience", creation of regional and international emergency response networks, and strengthening public awareness about the risks. These were major themes at the 2005 World Conference on Disaster Reduction (Kamlage and Süssdorf 2005), the World Health Organization Conference on the Health Aspects of the Tsunami Disaster in Asia, held in Phuket, Thailand, May 4–6, 2005,[1] and the Third International Conference on Early Warning, held in Bonn, Germany, March 27–29, 2006.[2]

2. Laying the groundwork for tsunami response management

Several important international and regional meetings, most of them taking place around the time of the tsunami, discussed collaborative measures that could be taken to mitigate the impacts of tsunamis and similar disasters, and ensure that citizens and authorities were better prepared for them.

The World Conference on Disaster Reduction, convened by the United Nations General Assembly, took place in Kobe, Japan, on January 18 to 22, 2005, with the intention of raising the profile of disaster risk reduction in development planning and practice, and thus making countries and communities more resilient to natural disasters.[3] A special session was scheduled within the conference on the Indian Ocean tsunami. The main topic of the discussions at the special session was establishment of a tsunami early-warning network for the Indian Ocean similar to the one that protects the Pacific. This followed calls for such a system by, for example, the Special Leaders' Meeting of the Association of South-East Asian Nations (ASEAN) on the Aftermath of Earthquake and Tsunami, held in Jakarta on January 6, 2005, and the United Nations Conference to Review the Implementation of the Programme of Action for the Sustainable Development of Small Island Developing States, held in Mauritius from January 10 to 14, 2005. The delegates at the World Conference also emphasized the importance of educating coastal populations so that everyone should know what a tsunami is and be able to recognize the warning signs (United Nations Inter-Agency Secretariat of the International Strategy for Disaster Reduction 2005).

A few days after the World Conference on Disaster Reduction, on January 28, 2005, the 59th session of the United Nations General Assembly passed the Resolution on Strengthening Emergency Relief, Rehabilitation, Reconstruction and Prevention in the Aftermath of the Indian Ocean Tsunami Disaster (United Nations General Assembly 2005).

Almost at the same time as the Kobe meeting, on February 6–9, 2005, Ramsar Center Japan's Asian Wetland Symposium was held in Bhubaneshwar, Orissa, India. A special session looked at tsunamis and coastal wetlands. This session produced recommendations as follows:

1. There is an urgent need for coordinated and harmonised assessments in priority stretches of affected coastline in order to identify areas where ecological restoration would be most effective.

1. For more information on the WHO Conference on the Health Aspects of the Tsunami Disaster in Asia, see http://www.who.int/hac/events/tsunamiconf/en/.
2. For more information on the Third International Conference on Early Warning, see http://www.ewc3.org/.
3. For more information on the World Conference on Disaster Reduction, see http://www.unisdr.org/wcdr/.

2. Develop predictive guidelines on the value and appropriate positioning, structure and composition of natural greenbelts to provide protection to coastal communities from severe storms/tsunamis.
3. Integrate wetland restoration and management options with the immediate response to the humanitarian needs and the short and medium term action and recovery plans in tsunami affected countries.
4. Develop community led approaches for protection and restoration of affected and other wetlands, drawing on traditional knowledge and practices and with provision of incentives for sustainable livelihood development.
5. Prioritise the enhancement of natural coastal defenses through greenbelt/coastal "bioshield" development and only consider hard engineering solutions in combination with natural measures and in areas where there are no alternatives to safeguard human life.
6. Establish and enforce "no construction zones" in vulnerable areas and manage them to enable sustainable use by local communities as well as ecosystem recovery.
7. Build on and strengthen the regional/international cooperation mechanisms to connect governments, agencies, institutions, communities and individuals. Combine their competencies in assessment and in developing and implementing action plans, related to the tsunami response and coastal wetlands (Ramsar Center Japan 2005).

Just over a year before the Indian Ocean tsunami, on October 16–18, 2003, the UN International Strategy for Disaster Reduction (ISDR) secretariat and the German Foreign Office organized the Second International Conference on Early Warning, held in Bonn, Germany. It discussed how the effects of natural disasters could be reduced by issuing timely warnings. A basic framework was agreed for installing appropriate systems worldwide (Second International Conference on Early Warning 2005). It also focused on what roles governments and the media should play in early warning and how to prevent the outbreak of disease in emergency situations. Germany announced that it wanted to establish a small early warning office in Bonn, at its own expense, which could become the nucleus of the early warning secretariat under the Geneva-based ISDR that many experts want. The first International Conference on Early Warning, held in Potsdam, Germany in 1998, had already drawn attention to various aspects of early warning and called for it to be made the subject the core of national and international precautionary strategies in the twenty-first century.

The June 6, 2005 ASEAN meeting in Jakarta committed the regional grouping to cooperate both internally and with other countries in the areas of emergency relief, rehabilitation and reconstruction and of disaster prevention and mitigation. This was quickly followed by the ASEAN Ministerial Meeting on Regional Cooperation on Tsunami Early Warning Arrangements, in Phuket, Thailand on January 28 and 29, 2005, which adopted the Declaration on Regional Cooperation on Tsunami Early Warning Arrangements (ASEAN 2005a). An ASEAN Agreement on Disaster Management and Emergency Response was signed at the 38th ASEAN Ministerial Meeting in Vientiane, Lao PDR, on July 26, 2005 (ASEAN 2005b). The intention of the agreement was to “provide effective regional mechanisms to mitigate the impacts of natural and human-induced disaster and serve as a joint response to disaster emergencies through concerted national efforts and intensified regional cooperation.” (ASEAN 2005c).

The ministers conceived of the agreement as a contribution towards efforts to develop a global early-warning system.

3. Institutional arrangement for tsunami warning

In July 2005, the UN Education, Scientific and Cultural Organization (UNESCO) announced the establishment of the Indian Ocean Tsunami Warning and Mitigation System, a cooperative system including an improved seismographic network, a real-time sea-level observing network, and deep-sea pressure sensors, feeding information to national tsunami warning centers and emergency services agencies in at least 19 countries. The planned system was expected to be complete by July 2006, at a cost of US$30 million. When fully operational, the system is expected to provide early warning of potentially devastating undersea earthquakes, and of the tsunamis they may cause, enabling the evacuation of coastal communities around the Indian Ocean. A similar early warning system had already been in place since 1968 in the Pacific Ocean, site of 85 percent of all tsunamis, centered on UNESCO's International Tsunami Information Center in Honolulu, Hawaii, USA. There are plans to expand the existing network of underwater sensors in the Pacific into the Atlantic and the Caribbean.

The Pacific Disaster Center (PDC) on the island of Maui, Hawaii, managed by the East-West Center, was in place at the time of the Indian Ocean tsunami. The PDC's mission is to provide applied research and analysis for the development of more effective policies, institutions, programs, and information products for disaster management in, and humanitarian assistance to, communities of the Asia-Pacific region and beyond. One component of the PDC's Asia Pacific Natural Hazards Information Network is the Indian Ocean Tsunami Response Geospatial Information Service, which provides geospatial information, including maps of coastal areas affected by the 2004 Indian Ocean tsunami, for emergency managers and the general public through the PDC website (www.pdc.org). In February 2005, the PDC launched a new website, ThoughtWeb Relief (www.thoughtweb.com/relief/), which intends to better prepare disaster relief experts to collect, interpret, and prioritize information they may use in decision making in addition to coordinating and integrating information on relief and recovery operations.

The World Bank's Hazard Risk Management Unit, founded in 1998 as the Disaster Management Facility, aims to provide proactive leadership in introducing disaster prevention and mitigation practices in the full range of development-related activities and improving emergency response. It operates on the theory that while natural hazards may not be preventable, losses can be reduced through knowledge of vulnerability of risks; sound engineering practices and construction standards; and sound environmental management and land-use planning. The key functions of the unit include, among others, partnership with non-governmental organizations (NGOs) and scientific organizations to promote dialogue on disaster management issues; examining the World Bank's disaster assistance portfolio; dissemination of a data base of good practices through the unit's website; and training in the areas of disaster prevention, mitigation, and response, including curriculum development and training events. The unit has a Consultative Group on Global Disaster Reduction, which addresses critical issues of disaster loss reduction in developing countries. It comprises a partnership of international financial institutions, governments, international agencies, NGOs, academic institutions, and private-sector institutions

dedicated to building more resilient communities. Its specific goals include the development of mechanisms to ensure a coordinated response to disasters and a unified assessment of damage and needs; new tools for evaluation and inclusion of disaster risks in development projects; strategies to reduce the vulnerability of low-income communities to natural disasters; and recommendations to address environmental degradation affecting the frequency and severity of disasters.

4. Recommended priorities for tsunami response planning and management

Clearly the December 2004 tsunami has inspired in the international community commitment to prevent a similar catastrophic loss of life and livelihoods should such an event recur. But translating these good intentions and grand plans into effective action on the ground is a longer project. Sound strategies and careful work right down to community level will be needed to make sure that projects such as the early warning system actually do make people safer. Planners and managers of tsunami responses should consider the following suggestions.

4.1. Local community capacity building

Invest in efforts to prepare communities at risk that could be sustainable over generations. Frequent changes in national government are a common feature of many of the countries most at risk from natural disasters such as the Indian Ocean tsunami, and donors' interest in high-technology early warning systems could wane or entirely dissipate as changes in government occur. An example of a sustainable solution would be investment in strengthening capacity in the areas of search, rescue, and first-line care. This would naturally be done at a local level, and thus be insulated from the vicissitudes of national government; and it could achieve much in reducing mortality rates from disasters, not least because most deaths from a disaster such as a tsunami or earthquake occur within six hours and it is virtually impossible for international rescue teams to arrive on the scene within that time.

4.2. Action plans

There should be no warning systems developed without action plans. A lot of information came to fore after the 2004 tsunami indicating that the national disaster warning systems in place failed to pass on or react properly and adequately to the warning information they received. India's defence ministry was allegedly content with simply informing the Home Ministry of the warning a day after it received the warning. To be effective, government agencies should know whom to inform immediately if people are to be told where to go for protection and hospitals are to know how to respond to exceptional emergency caseloads.

4.3. Multi-hazard warning system

A tsunami early warning system should form part of a multi-hazard warning system that also covers typhoons, floods, earthquakes, volcano eruptions, and other such rarely occurring events. A warning system exclusively for tsunamis would not be cost effective and could easily end up as one of the less important tasks of geological service functionaries who might neglect or even abandon it.

4.4. Developing disaster preparedness

Disaster preparedness is better done than talked about. Fewer international and inter-governmental meetings on precautionary strategies are needed and instead, more efforts should be devoted to training for disaster preparedness. Development banks should help countries that show willingness and commitment to develop their disaster preparedness, and thus minimize obstacles to achievement of development goals. For instance, at a low cost, development banks could assist countries to install low-technology but simple and effective local flood-warning equipment. This equipment, which could include, for example, a device that would automatically issue a loud warning whistle if water reached a critical level, would be a first line of defense against a natural calamity. It would be much more economical than spending huge effort and resources on rescue and humanitarian assistance if a disaster actually occurred and people did not have adequate warning. Of course, the ideal would be the presence of quake-proof seawalls of sufficient height, detailed hazard maps showing danger areas, and well-defined evacuation routes and shelters, as well as ways to alert the people at risk.

4.5. Threats other than tsunamis

In the haste to respond to the Asian tsunami, we must not overlook many other current threats that could also result in disasters of incalculable proportions, specifically in terms of loss of human life—and are perhaps more likely to do so in the medium term. Among these are famine and diseases such as avian influenza and dengue. These are also emergencies that call for warning systems and rapid responses.

4.6. Community to community parnerships

Extraordinary events call for extraordinary action. Interest after a disaster is generally high, but wanes rapidly. To sustain interest, a systematic community partnership program similar to a “sister city” program should be established. But unlike sister cities, the donor town, city, or state would be required to make a substantial and enduring commitment to provide assistance to the impacted community according to an agreed plan. Such inter-community partnerships could give private citizens and organizations leading roles, give the rebuilding effort a human face, and divide it into units that are comprehensible and accessible to donor communities. They would thus enable individual donor communities more easily to see the progress of the communities they are helping and encourage public and civic organizations to develop local sub-partnerships. The UN Development Programme (UNDP) could perhaps act as a broker, encouraging and helping to build partnerships, evaluating plans, and even linking private-sector and local community efforts with its own work (East-West Center 2005; Elliesen 2005).

4.7. International and regional regime

Developing an international regime for handling disasters should be a regional and global priority. While there are international systems in place with standards and norms that address world trade, nuclear non-proliferation, environmental protection, and human rights, nothing comparable exists for preventing and dealing with disasters. This is an area in which developing countries could take the lead by establishing standards, because disasters often hit the poor the hardest in developing and least-developed countries. As commentator Jeffrey Sachs correctly pointed out:

> What the rich world suffers as hardships the poor world often suffers as mass death. The rich, unlike the poor, can afford to live in fortified structures away from floodplains, riverbanks and hillsides. The rich, unlike the poor, have early warning systems – seismic monitors, weather forecasts and disease-surveillance systems… and rich countries, unlike the poor ones, can quickly mobilize food, drinking water, backup power generators, doctors and emergency medical supplies in the aftermath of disaster (Sachs 2005).

5. Alternative approaches

Environmentalists have had much to say about tsunami prevention and reconstruction. They are calling for education and awareness of coastal people about the dangers of tsunamis; a slowdown in development; and acceleration of establishing natural barriers. In recent decades, vast tracts of coastal mangrove forests have been leveled to make way for shrimp farms, tourist resorts, and industrial projects, while sand dunes have been looted by the construction industry. In the December 2004 tsunami, communities lying behind a fringe of shallow-water mangroves, like parts of India's coastline, or behind an intact coral reef, as in the Maldives, suffered less damage and loss of life than places exposed directly to the full force of the waves. Mangroves, sand dunes, and coral reefs can all act as a natural coastal defense. Environmentalists are pushing for the planting or re-planting of mangrove forests, and for more considered development and protection of coastal areas. The hope now is for a green wall to rise before the next tsunami occurs.

An environmentalist perspective has also helped in the rebuilding efforts. In the areas closest to the earthquake's epicenter, where acres of mangroves, coral reefs, and seabed grasses, all vital fish habitats, were damaged, timber donations were specifically requested from donor countries so that local people did not have to further denude mangroves for rebuilding. In areas where the tsunami waves left sediments and toxins in aquifers, farmers are being encouraged to plant salt-tolerant crops like pumpkins and kale so that the remaining uncontaminated aquifers can be used for drinking water.

6. Conclusion

As a Chinese proverb goes, "a calamity is a time of opportunity." The 2004 Indian Ocean tsunami served as a wake-up call and has provided the will—however fleeting it might prove to be—to radically improve disaster planning and management. It showed that there is an urgent need to develop a disaster management system for natural disaster-prone developing and least-developed nations. This management system should embrace not only provision of relief, prevention of disease, and rebuilding of communities, but should extend as well to development of institutions and warning systems that lead to action that can prevent human catastrophes, involve local people and NGOs, and build on voluntarism. The approach should be based not on superficial, knee-jerk reactions but on in-depth study of the challenges posed by tsunami response planning and management; on past evidence and on present realities. With well-considered plans and effective management schemes in place, many deaths and the destruction of large amounts of property could be prevented, or at least greatly reduced, in future disasters. And, in time, we could make our peace with nature.

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Essay

Wetland Cultural Heritage in the Pacific

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Local people contribute much to wetland conservation, and the Pacific island countries offer invaluable information demonstrating the cultural value of wetlands vis-à-vis sustainable livelihoods. Drawing primarily on examples from Papua New Guinea, the Solomon Islands and Fiji, but generalizing for many of the Pacific countries, this paper argues that traditional uses of and indigenous cultural expression in wetland areas, and the wise use of wetland resources, should be identified and incorporated in the conservation and management of these unique aquatic-terrestrial ecosystems. The paper concludes that governments need to recognize and support those cultural expressions of communities that are manifested in time-honored and tested uses of wetlands. With appropriate support and assistance, Pacific island countries could lead the rest of the world in developing new and innovative mechanisms for the sustainable use of wetlands as a source of livelihood.

Keywords: wetland, Pacific, Papua New Guinea, Solomon Islands, Fiji, Ramsar Convention

1. Introduction

The Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) defines wetlands as "areas of marsh, fen, peatlands, or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine waters, the depth of which at low tide does not exceed six metres" (Convention on Wetlands 1971). Wetlands in the islands of the Pacific include estuaries and deltas, mangroves and inter-tidal mudflats, coastal lagoons, freshwater lakes and marshes, swamp forests, rivers and streams, and coral reef systems.

The term cultural heritage refers to the complex whole of life's activities, including those beliefs, values, customs, mores, and traditions that are embodied in folklore and ethnography, and relatable to environmental concepts at the local level. Included are communal creations such as dances, songs, myths, and designs.

The principal functions of wetlands include, among others, shoreline stabilization and reduction of erosion; flood storage; groundwater recharge and discharge; sediment trapping; nutrient retention and removal; support for food chains; and the provision of wildlife habitats. They are also used for fishery and recreation. However, wetlands also have cultural heritage values as a consequence of these functions. For example, a wetland that functions as wintering ground for waterfowl may also be valued by local people who customarily harvest birds for food and ornaments. Furthermore, such a wetland

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might attract eco-tourists, as well as being an educational resource for television viewers around the globe.

Indeed, the wetlands of the island countries of the Pacific greatly benefit their inhabitants. They are part of the region's natural and cultural heritage which must be treasured and conserved for posterity. Despite the impacts of global warming and the threats of sea-level rise, the Pacific wetlands should be extensively and effectively managed in order to maintain their functions and values for the subsistence and well-being of the islands' inhabitants.

2. Communal land ownership as cultural information resource

Common to the South Pacific countries (which include, among others, Fiji, Kiribati, Papua New Guinea, the Solomon Islands, Tuvalu, and Vanuatu) and their Melanesian culture, is the practice of "customary" ownership of lands, which means that land is owned by groups or clans but used by individual households. In a typical land tenure system, which extends to wetlands, users of the land will normally have the right of access and permanent tenure and to temporary cultivation, the right to harvest and to hunt, and the right and to grant occupancy of the land to strangers. Such rights in communal ownership are widely known to also regulate exploitation of resources (Asian Development Bank 1995).

A common thread that runs through ancestral communal land ownership, specifically in Papua New Guinea and the Solomon Islands, is the *sing-sing*, a celebration to strengthen relationship among kinfolk and between human and spiritual beings. Apart from rituals and ceremonial dances, some *sing-sings* feature pig sacrifices, where hundreds of swine are killed one after another as a sort of socio-cultural agreement between people and their ancestral spirits, aimed at strengthening old ties, creating new ones, or simply restoring ties that are broken. Domestic pigs are held as sacred by the indigenous peoples of the region, who believe that the beasts communicate directly with the ancestral spirits.

The *sing-sing* is a spectacular show, where glistening, warrior-like men dress up in their finest: pig-tail aprons; cummerbunds woven from mangrove vines; cassowary quill, pig tusk, and hornbill beak necklaces; and yellow and red face paint, all topped with wigs and headdresses decorated with splendid bird of paradise plumes and forest flowers. The men dance simply, in a rotating line-up, making an eerie, squeaking cry: a call on their ancestors to mediate and somehow help them experience salvation on earth, which is understood as an abundant life endowed by resources from their natural environment. Referred to by Western researchers as an "ancestral cult", the ancient practice of ritual dance is an integral part of the religious and cultural customs associated with the natural resources of their environment.

3. Wetland resource sustainability and thriving enterprises

Colorful multi-purpose and much sought-after *bilums*, a kind of string bag, have been in use in Papua New Guinea for many years. They are carry-all bags, and can be used as baby hammocks and for many other purposes. *Bilums* are made out of a palm that grows in or near wetland areas. This material is also used for making bows and arrows for hunting, which have recently become desirable decorative objects for tourists. Three artifact shops have opened in the Crater Mountain area of Papua New Guinea, one at

Herowana, another that has been opened by the local clan near the airstrip in Maimafu, and another that has recently opened in Haia. All are yielding valuable income for their respective communities.

In other areas, research has developed into a resource-earner for the village people. For example villages in Verata, Fiji, set up *tabu* (no take) areas and monitored and documented the effects. Areas that were previously bare rock were found, after a time, to be covered with a sandy substance preferred by clams. Another village started replanting sea grapes, an important nutritional and cultural food that disappeared years ago due to over exploitation. Village women bought the grapes from the market, ate the fruits and then planted the stems in their *tabu* area. Sea grapes were found to grow again. The community attributed all this to leaving the area undisturbed in accord with traditional knowledge to ensure the regrowth of plants and living organisms. On the other hand, in Makira in the Solomon Islands the focus of the local people is on NGO and government-assisted ecotourism, as well as on modernized extraction of ngali-nut oil; partly for their medicinal and other daily needs, but mainly for the production of high-quality bath soaps and oils for sale to tourists.

Lately, the coral reefs of the South Pacific are attracting much attention as a source of novel chemicals that may hold cures for cancer, AIDS, and drug-resistant bacteria. These corals, which are traditionally part of the Pacific islanders' environment, are the object of growing interest from pharmaceutical companies prospecting for chemicals with medicinal potential. They are a new source of significant economic returns from marine resources. Verata, a county near the Fijian capital of Suva that consists of eight villages, is renowned worldwide for its blue-green coastal lagoons and abundance of marine resources. Recently, the residents of Verata joined with the University of the South Pacific (USP) to establish a unique bio-prospecting agreement with Strathclyde Institute of Drug Research (SIDR), a pharmaceutical research group in Scotland. The project began by helping the communities to develop and implement a bio-prospecting agreement. People are naturally interested in having their medicinal plants evaluated and receiving financial benefits for their efforts. Villagers collect and do the preliminary processing of samples. Instead of simply selling the plant or animal samples to a pharmaceutical company, extracts are prepared at USP and then licensed for evaluation by the SIDR to pharmaceutical companies for evaluation. Payments to the villages are derived from the licensing of the samples. After one year, the samples may be further licensed by SIDR or returned to Fiji. Since Fiji is a relatively small country and the project participants have close contacts with appropriate government officials, the project has also been well positioned to influence government policy regarding prospecting at a national level. Additionally, the practice demonstrates that local communities can make the decisions necessary to manage their biological diversity, especially in the Pacific where most indigenous people have clear rights of tenure over their resources.

The Verata model of bio-prospecting agreement proves that local communities can be effective partners in marine conservation provided that their knowledge and skills are acknowledged and respected. An understanding of traditional management practices is useful as it is generally easier to adopt something that people already know than to introduce an entirely new concept. At the same time, the involvement of women and youth should be encouraged, as this can lead to broader participation and a greater chance that the management of resources will be sustainable.

In the Solomon Islands, an assisted fishing enterprise demonstrates the successful use of modern conservation efforts alongside traditional fishing customs, such as through the practice of forbidding fishing in certain areas in certain seasons. In the white beaches, lagoons and coral reefs of the Arnavon island group in the Solomon Islands live an extraordinary diversity of marine mammals, including the endangered hawksbill turtle. They also support commercially valuable animals such as *bêche-de-mer* (sea cucumbers), trochus, black- and gold-lip pearl oysters, and giant clams, as well as an abundance of reef fish. The islands' economy has traditionally relied on harvesting these organisms on an open access basis. In the 1980s, shellfish prices rose steeply, and so did the temptation to over-harvest them. Gradually the stocks were depleted.

In response the government established the Arnavon Islands Community Marine Conservation Area, in which there are prohibitions on the taking of commercially valuable key species. The project involves implementing a management plan in the *tabu* area, as well as a sustainable deep-water finfish enterprise at two sites to provide the local communities with alternate food and income while taking the pressure off the reef species. Six community officers from the village monitor the project. The creation of the conservation area marks the first time that communities in the Solomon Islands have created a marine sanctuary, as well as being the country's first cooperatively managed marine conservation area. Today, turtles nest in peace on the small islands of the Arnavons group, and mangroves are growing back both naturally and in response to a replanting effort by conservation officers. Even the previously depleted stocks of marine invertebrates are beginning to return to natural numbers and there is a noticeable upsurge in the resident bird populations, in particular among the previously heavily hunted pigeons.

4. Wildlife management areas as effective protected areas

In Melanesian culture, land is a sacred inheritance; it has a sacred association with its traditional owners and is never for sale. Thus, very few protected areas have been established in Melanesia. There is little legislation that enables protected areas to be formally and successfully established on customary-owned land.

In the Solomon Islands, for example, the Queen Elizabeth II National Park in Honiara on the historic island of Guadalcanal is an illustration of the futility of establishing protected areas without regard to the unique cultural and developmental context of the country. It is the nation's only national park and was established in 1954 to protect a sample of lowland tropical rainforest. Most of the park has since been cleared for food gardens and the trees felled to provide timber for family homes. Its designation as a national park is of no concern to people who were not taken into account when the grand protective title was bestowed on their land. They received no immediate benefits from the park's protected status and simply carried on using the forest for its useful resources of timber and firewood.

Papua New Guinea could, perhaps, be said to be in a better position. Its forests are outstanding for their wealth of diversity and the uniqueness of their flora and fauna. A plethora of flowering plants, 200 species of frog, and an unusual variety of birds are found in the country. This rich diversity is owned and used by the indigenous Papua New Guineans in their daily life and traditional festivals. Mention should also be made of the country's home gardens, which not only supply households with materials to

weave baskets for domestic use but also provide a habitat for a diverse set of freshwater fish, frog, plant, and insect species.

Communities that value their natural assets and are concerned about the effects of forest clearance, logging, or modern hunting pressures on wildlife species have established portions of their land as wildlife management areas (WMAs) in accordance with the country's environmental legislation. Under a WMA covenant, landowners draw up rules, often based on traditional methods of conservation, for harvesting animals and protecting habitats. The main role of a WMA is to protect species of economic value to the landowner, such as birds of paradise for their plumes; megapodes for their eggs, which are eaten and sold at local markets; and dugongs, which are important as a traditional source of food. While landowners retain full control over the land and its resources, the Papua New Guinean government assists with legal recognition of the protected sites.

Whether or not WMAs offer long-term security for the landowner remains uncertain. Be that as it may, the principle of landowner control over conservation initiatives is an important one for Melanesia, and other governments in the sub-region are expressing interest in adopting the same principle in their own countries. In fact, community members in Balai on Malaita Island in the Solomons have initiated a protected-area project. Clan landowners have drawn up a collective management plan for the tribal land. Part of their land, which they agreed to have logged in the 1980s, will be replanted with tree species that are important to the community as providers of timber for building houses and canoes, for fuelwood, and for fruit. The most fertile land that the group owns is being managed for food gardens and the remaining forested land, an area of around 15,000 hectares, is to be set aside in a reserve. Clan members have chosen to reserve their forests to protect the water catchment above their gardens, and to protect the habitat of pigs and other domestic animals and plants. Another potential benefit lies in establishing a nature tourism enterprise, which will involve guiding tourists through the rainforest with its rivers and streams, wildflower meadows, wildlife, and other resources. In another project in Fiji, where it is also not permitted to sell indigenously owned land, a conservation lease agreement with local communities is being considered under which compensation would be made for lost financial opportunities, such as the sale of timber.

5. Conclusion

The Conference of the Parties (COP) of the Ramsar Convention has recognized the value of the cultural heritage and traditional uses of wetlands to the conservation of such areas and the wise use of their resources. Towards that end, Article VIII of the COP encourages incorporation of relevant aspects of cultural heritage into both the design and implementation of wetland management plans.

The Convention on Biological Diversity, on the other hand, recognizes the role of indigenous and local communities in conservation *in situ*. The Convention's preamble acknowledges the "close and traditional dependence of many indigenous and local communities embodying traditional lifestyles on biological resources, and the desirability of sharing equitably benefits arising from the use of traditional knowledge, innovations and practices relevant to the conservation of biological diversity and the sustainable use of its components" (Convention on Biological Diversity 1992). Furthermore, Article

VIII of the Convention outlines the specific obligation of each Contracting Party "Subject to its national legislation, (to) respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote the wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices" (Convention on Biological Diversity 1992).

As keepers of cultural information resources, the people of the Pacific island countries possess a wealth of indigenous knowledge and local experience on environmental management. With this information, they can adopt development models which emphasize economic growth but do not jeopardize social and environmental sustainability. They should chart their own development path and balance their development strategies, making use of their cultural heritage to strengthen self-reliance in their quest for progress and development. To be more specific, the people of the Pacific islands, with appropriate government support, should effectively link their customary law and traditional practices into the nexus of sustainable development and protection of the environment. As a first step, the integration of their traditional environmental and management practices into the arena of legal and economic systems needs to be examined in order to produce a more comprehensive environmental/sustainable development package for the Pacific. Thereafter, with appropriate support and assistance, Pacific island countries could lead the rest of the world in developing new and innovative mechanisms for the sustainable use of wetlands as a source of livelihood.

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Before his stint as Chief of the Philippine Mission to Qatar, Ambassador Amado S. Tolentino, Jr, served as Philippine Ambassador to Papua New Guinea and non-resident Ambassador to the Solomon Islands and Kiribati. Presently, he is Executive Governor (for developing countries) of the International Council of Environmental Law, a public interest organization with consultative status at the UN, based in Bonn, Germany. He is also a member of Ramsar Center Japan's International Advisory Group.

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