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Special Contribution

Strategic Research on Global Environmental Issues at IGES

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1. About the Institute for Global Environmental Strategies (IGES)

IGES was formally established in 1998 under the initiative of Japanese government. Its mission is to realize global-scale sustainable development in the 21st century through the pursuit of policy research and the promotion of its recommendations for environmental policy implementation. IGES is not a purely academic institution; instead, it is a policy-oriented and practical research institute that contributes to environmental policymaking and implementation at international, national, local and even community levels. Apart from research activities, IGES also engages in information-dissemination activities and capacity-building or training activities.

The target area of study for IGES is the Asia-Pacific region. This emphasis was chosen not merely because IGES is located in the region, but also because environmental policy research for this region will be increasingly important in the upcoming century. While it is anticipated that the Asia-Pacific region will be the world center of growth in the 21st century in terms of population, economic activity, resource consumption and environmental degradation, socioeconomic policy research on environmental issues has been insufficiently conducted for the region. IGES hopes to address this gap through its research focus on this region.

During its preparatory stage, IGES staff members visited the countries of the region and consulted with politicians, government officials, environmental researchers and non-governmental organization staff to identify crucial environmental issues in the region to be studied. Issues discussed during consultations were global warming, forest and biodiversity conservation, urban environmental management, environmental education, environmental governance (environmental policies, laws and regulations, administration and implementation) and water resource management and marine pollution. As a result of these consultations, IGES selected the first five topics as the subjects of its projects for the first phase (1998 to 2001). The water issue was not selected because the problem varied from one location to another and was therefore difficult to formulate as a policy research project during the initial stage. Later, after research operations had commenced, the new development pattern project was organized as a cross-cutting or integrated project.

All these projects can be characterized as strategic research. The Charter for the Establishment of the IGES—signed by representatives of ten national governmental organizations, four international organizations and twenty-one international research organizations—provides in its preamble that an effective way of creating a new paradigm for global civilization is to conduct strategic research on policies and practical measures, and to make these results applicable for policymaking and decision-making by various bodies. The Charter also provides three principles for conducting strategic research: (1) the research should be independent; (2) the research should be internationalized through joint research projects and researcher and information exchange and (3) the research and its results should be open to all stakeholders.

2. The nature of strategic research

What, then, is strategic research and how is it different from policy research?

Before discussing the nature and contents of the strategic environmental research, it is necessary to examine the connotations of the word "strategy", which originally derived from warfare. The *Oxford English Dictionary* defines strategy as "the art of projecting and directing the larger military movements and operations of a campaign". "Strategy" is distinguished from "tactics", which is the art of handling forces in battle or in the immediate presence of the enemy. The *New Encyclopaedia Britannica* defines strategy as "the science or art of employing all the military, economic, political and other resources of a nation to achieve the objects of war". It deals with the entire theatre of war and the use of battles to win wars. In Napoleon's campaigns, operational strategies consisted of the concentration of all forces against an enemy at its critical point, the careful preparation and the uniting of forces before action to deliver an overpowering strike in a shock attack and the selection of advantageous battlegrounds for his forces. However, Napoleonic strategy became ineffective during the American Civil War when the use of long-range infantry rifles shattered the effectiveness of rapidly concentrated infantry attacks. Since then, military strategies have drastically changed in response to arms developments such as high-powered artilleries, airplanes and atomic bombs. These historical developments in military strategies indicate that strategies are devised dynamically in response to circumstantial factors and mobilize all measures to achieve effectively the goal.

"Strategy" is also used in the context of business administration. The *Oxford English Dictionary* defines strategy as "in circumstances of competition or conflict, as in the theory of games, decision theory, business administration, etc., a plan for successful action based on the rationality and the interdependence of the moves of the opposing participants". A famous Harvard Business School professor, Michael E. Porter, in his article titled "How Competitive Forces Shape Strategy" (1979), wrote that the essence of strategy formulation is coping with competition. He analyzed five forces that govern competition in an industry: the threat of new entrants, the bargaining power of customers, the bargaining power of suppliers, the threat of substitute products or services and the jockeying among current contestants. To establish a strategic agenda for addressing these contending currents and to advance in spite of them, a corporate strategist must first assess the forces affecting competition in his industry and underlying causes for those factors. He must also identify his company's strengths and weakness. Then he can devise a plan of

action that may include: (1) positioning the company so that its capabilities provide the best defense against the competitive forces; (2) influencing the balance of forces through strategic moves, thereby improving the company's position and (3) anticipating shifts in the factors underlying the forces and responding to these shifts, with the hope of exploiting change by choosing a strategy appropriate for the new competitive balance before opponents recognize it.

Both military strategy and business strategy have critical elements in common. Military strategy is formulated to win wars against enemies by analyzing objectively surrounding conditions and by choosing an alternative that mobilizes all forces available in the most effective manner. Business strategy is formulated to cope with business competition. As with military strategy, it is crucial in the business strategy-making process to assess factors affecting competition and underlying causes for those factors before formulating a strategy. On the basis of his analytical findings, a business strategist may devise various scenarios and look for measures to implement them. Then he can apply a cost-benefit analysis to each scenario to determine the effectiveness of each measure under different business circumstances. Using this analysis, he can choose the most effective and efficient scenario out of all the alternatives as the strategy to achieve his goal.

With these descriptions in mind, the strategic approach can be summarized briefly as having the following requirements: (1) the final goal to be achieved should be identified; (2) the state of affairs relevant to the goal should be assessed; (3) scenarios to achieve the goal should be formulated; (4) measures to implement respective scenarios should be identified; (5) a cost-benefit analysis for each scenario should be made and (6) a scenario with comparative advantages for achieving the goal under the surrounding conditions should be chosen.

3. Global environmental strategy

Since the 1980s, global environmental problems have drawn the attention of the international community. These problems include the reduction of rain forests, soil erosion and desertification, depletion of biodiversity, marine pollution, global warming, depletion of ozone layer and other phenomena that affect the environment on a global scale. The features of global environmental issues are similar: most of these issues arose from ordinary human activities and were caused by numerous and diverse sources; the mechanisms of these phenomena are so complex and the phenomena themselves take so long to appear that it is often difficult to identify their actual causes; and the impacts on environment may cover wide geographical ranges and may be long-lasting and irreversible.

Because of the complex nature of the issues involved, the formulation of strategies is much different for global environmental problems than for local and regional environmental problems. For instance, with the local environmental problem of industrial pollution, it is relatively easy to identify the sources and pollutants. The goal of a strategy to deal with industrial pollution is to regulate (by reducing or eliminating) pollutants. The target of such regulation may be a rather limited number of large factories that discharge pollutants. Therefore, command-and-control types of regulation may effectively regulate pollutants, and economic measures, such as charges or subsidies, can be used as alternative measures. The crucial issue here is to determine the most efficient level of regulation using cost-benefit analysis.

What are the impacts of pollutants on the human health and the environment? What are the direct costs of controlling pollutants? What are the social costs (e.g., impacts on employment) of the regulation? What are the costs for the administration of regulatory measures?

With the case of global environmental issues, however, the formulation of strategies is even more complicated than with local environmental issues. First of all, comprehensive goals for global environmental strategies are difficult to determine. As mentioned earlier, global environmental issues contain diverse phenomena, from diminution of biodiversity to climate change. Therefore, the goals for coping with such wide-range and diverse issues are not as simple as for coping with industrial pollution. Even if we choose a single global environmental issue such as global warming, scenarios and measures to reduce the greenhouse gases must be diverse and complex because its causes are diverse and relate to all kinds of human activities.

Apart from the problem of formulating comprehensive goals for global environmental strategies, the formulation of strategies for global environmental issues is also difficult because it involves many more variables than for local environmental issues. Financial, technological and human resources for implementing strategies vary from one country to another. Needless to say, social, economic and political conditions are also different for each country. Awareness and attitudes of policymakers and the public towards global environmental issues are diverse, and the priorities of society may not be on the environment. Therefore, an environmental strategy suitable for one country may not be feasible for another country lacking the capability and capacity for implementing the strategy.

What about sustainable development as the goal for global environmental strategies? In 1987, the World Commission on Environment and Development proposed the concept of sustainable development in its report to the U.N. General Assembly titled *Our Common Future* (1990). The Commission defined sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In light of rapidly growing world populations and the consequential increase of pressure on global resources, the report warns that sustainable development can only be pursued if population size and growth are in harmony with the changing productive potentials of the ecosystem. It also emphasizes that sustainable development is not a fixed state of harmony, but, rather, a process of change through which the exploitation of resources, the direction of investments, the orientation of technological development and the change of institutions are made consistent with future as well as present needs. Sustainable development can be the final goal of global environmental strategies. However, it is still too abstract to use for the development of concrete strategies. If a strategic goal is too abstract, no one will be able to evaluate whether implementation of the strategy has achieved the goal. Therefore, at this stage it may be more practical to use more concrete goals for each environmental issue. For example, with the issue of climate change, the strategic goal for one country could be the reduction of greenhouse gases by 6% in ten years (i.e., the reduction target for Japan under the Kyoto Protocol).

Even if strategic goals are set forth in a concrete manner (e.g., with quantitative figures), developing appropriate strategies for global environmental issues must involve many different possible scenarios and policy measures. This is because each global environmental issue involves complex mechanisms, a

vast number of stakeholder parties and a wide range of impacts on social and economic activities. These complexities make it difficult to choose a single strategy out of the many alternatives. In addition, financial and technological constraints also make it difficult to carry out the strategies themselves.

Because of the complex nature of global environmental issues, the decision-making process for choosing strategies to deal with such issues must depend on various practical factors. First, policy planners should study the scientific data and the state of the environmental issue. Next, they should identify underlying social and economic causes for the issue. Third, the goal to be achieved by a strategy should be determined. Finally, alternative strategic scenarios and policy measures must also be examined. Scenarios are roadmaps and time-schedules that indicate the processes by which policy measures are applied in response to changes in circumstances. Scenarios are dependent on various constraints in the country: political, organizational, economic, technical and other constraints. Policy measures are tools to implement the scenarios. For example, the policy measure of direct, or command-and-control, regulation has been widely applied to industrial pollution prevention. In this case, monitoring and enforcement by administrative bodies is relatively easy because the targets of regulation are a rather limited number of large factories. On the other hand, in the case of global environmental issues such as global warming, the involved activities and parties are so varied and numerous that command-and-control regulations are practically impossible to enforce. Because global environmental issues cannot be solved by one country alone, international cooperation is another important subject for global environmental strategic research.

The policy measures available for use in global environmental strategies are manifold. Recently, economic measures such as environmental taxes, charges, subsidies, emissions trading and deposit systems have been promoted as effective and efficient incentives for influencing human activities. Voluntary commitments by the private sector have been widely adopted in Europe because the private sector has the technology and capability to implement environmentally friendly actions in the most efficient way. Environmental management systems, such as ISO 14000 series, adopted by the private sectors are considered effective ways to promote the environmental activities of the business community. Information release systems, such as environmental reporting and environmental labeling, are also considered one of the most effective measures for affecting the activities of the businesses because these measures appeal to their desire to obtain good public reputations. By allowing businesses to enhance their public reputations through reports of their positive environmental records, these measures provide incentives for businesses to engage in environmentally friendly activities. Procedural measures such as environmental impact assessments are additional policy measures for improving development activities. All of these policy measures can be combined in a single strategic scenario.

In summary, surrounding factors and conditions must first be assessed in order to design a scenario to achieve an environmental goal. Then, in line with the assessment, policy measures must be selected. Environmental policies often have direct impacts on economies and economic policies and vice versa. Evaluation of each measure is necessary to choose specific measures that meet actual situations. Accordingly, the OECD (Organization for Economic Cooperation and Development) provides criteria for the evaluation of policy measures: environmental effectiveness, economic efficiency, impacts on economy, administrative costs, impacts on lifestyles of the citizens, impacts on international trade and technologi-

cal innovations, political and social acceptability, and feasibility. Because of the complexity and diversity involved with global environmental issues, the formulation of strategies for these issues is extremely difficult. Nevertheless, strategic research for the environment is necessary for future generations to enjoy the benefits of the environment.

4. Environmental strategic research at IGES

The main mission of IGES is to conduct strategic research on global issues in the Asia-Pacific region. How do we conduct this strategic research? As stated earlier, the state of the environment should first be studied. However, because IGES is not capable of monitoring and analyzing scientific data by itself, IGES collects environmental data through information-exchange networks with outside scientific institutes. We are now in the process of establishing worldwide networks and extending linkages with outside sources through internet systems.

To pursue its goal, IGES must also collect information on social and economic conditions of the countries in the region. Our research staff has been collecting—either independently, or with the cooperation of outside researchers—basic informational data on social, economic, legal and political matters in the region. In the first phase of its project, the EG (environmental governance) project team has collected information on environmental policies and legislation in six major countries in the region as basic data for strategic policy research. The EE (environmental education) project team is currently compiling data for a report on the state of environmental education in 36 countries in the region. The UE (urban environmental management) project team has conducted field studies on some cities in the region and collected statistical data. IGES will expand these information collection activities to disseminate information to other researchers in the region.

Information about the governmental structures and environmental legislation, as well as data for economic conditions, of each country is also important for devising an environmental strategy for that country. To develop effective regional cooperation in the region, information on international relations within the region is as important as information on national policies. With this in mind, IGES is trying to establish an information-gathering system as a prerequisite for identifying specific issues to be studied and for formulating strategies to cope with the identified issues.

Economic models to assess the costs and benefits of a specific strategy or policy measure are also useful for devising environmental strategies. The CC (climate change) project team has been applying the AIM model (one of global warming models developed by the National Institute for Environment – Japan) to assess the economic impacts of the clean development mechanism. The UE project team is developing urban environmental management models. At this stage, the final results of these efforts still remain to be seen. Each project team has exchanged ideas with outside researchers through joint studies or workshops to develop policy proposals in each project area. We expect to publish the results of each project's study in March 2001, at the conclusion of the first phase.

My goal for this paper is to initiate discussion on the nature and approach of strategic research for global environmental issues. I hope that this paper will contribute towards a fuller understanding of the

goals and directions of IGES—not only for those who are learning about IGES for the first time, but also for those already familiar with IGES, and even for researchers within IGES itself.

References

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