ECONOMY AND ENVIRONMENT PROGRAM
FOR SOUTHEAST ASIA

POLICY BRIEF

ASSESSING ENVIRONMENTAL VALUES: THE DAMAGE SCHEDULE APPROACH

In many countries, environmental management is hampered by lack of resources and expertise. However, a recent EEPSEA study has field-tested an analytical tool that offers a relatively simple and cost-effective way forward.

The study looked at two coastal areas in Thailand. It investigated whether the value judgments of local stakeholders could be used to gauge the significance of potential environmental damage. It went on to look at the applicability of such a 'damage schedule' approach to policy making. The study concluded that such this method offers a practical and effective tool for those involved in ecosystem management.

The study was undertaken by Ms. Ratana Chuenpagdee, a Thai PhD student at the Institute for Resources and Management, University of British Columbia. It involved a detailed four-part questionnaire which looked at people's reactions to development and environmental destruction, principally through a series of paired comparison questions.

The research was conducted in Ban Don Bay on the southeastern coast of the Gulf of Thailand, and Phangnga Bay on the southwestern coast of the Andaman Sea. Ban Don Bay has seen the rapid expansion of shrimp farming which has led to the clear-cutting of mangrove forests in the area. Phangnga Bay, on the other hand, is a tourist destination with coral reefs, sandy beaches and mangrove forests.

When potential conflicts arise between alternative resource uses, it is common for an environmental impact assessment (EIA) to be carried out. The findings of an EIA are generally presented in physical terms (e.g. so many hectares of mangroves lost, so

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much reduction in fish yields, and so on.) To facilitate comparison between alternative resource uses and between costs and benefits, these physical measures are sometimes converted into monetary values, using techniques developed by environmental economists. (For a guide to the valuation of tropical forests see EEPSEA Research Report *The Economic Valuation of Tropical Forest Land Use Options: A Manual for Researchers* by Camille Bann.)

EIA and valuation can be time-consuming and costly, and require specialized skills. For this reason, some policy analysts advocate the use of the "benefits transfer" approach in which environmental value estimates from previous studies are used in new sites. (For a discussion of this approach, see EEPSEA Special Paper *The Benefits Transfer Approach to Environmental Valuation* by Stale Navrud. An application of the method to water quality improvement in China can be found in a forthcoming EEPSEA Research Report by Du Yaping.)

The transfer of values between very different sites can be risky, however, and policy analysts continue to look for quick and inexpensive methods of impact assessment. One alternative is the "damage schedule approach", which values natural resources without expressing them in monetary terms. People are asked to rank examples of environmental loss or economic activity - for example, damage to mud flats vs. damage to coral reefs. Provided the answers are consistent, it is then possible to draw up scales of importance or 'damage schedules'. These reflect community values regarding the natural environment and the impact of different types of development. (The approach is derived from the damage schedules often used for purposes of compensation in the event of personal injury. Insurance policies often agree to pay so many thousand dollars for loss of a limb. There is no presumption that this accurately reflects the value of the loss, but it does allow negotiations to to be completed and action taken with a minimum of legal cost.)

In order to find out if such an approach is feasible and effective in developing countries, Chuenpagdee's research team interviewed about 200 people in each of the two study areas. To get a broad range of informed opinion, one fifth of respondents were formal experts, such as researchers, policy makers and scientists. The rest were people from businesses in the areas - fishers, shrimp farmers, shellfish culturers and tourism workers.

The interviewees were presented with numerous scenarios in which they had to choose between the loss of one natural resource over another. The resources included mangrove forests, mud flats and sandy beaches. Using the same paired comparison technique, interviewees were also asked to rank the environmental impact of shrimp fishing, hotel development and oil spills.

After analyzing the results, Chuenpagdee found that agreement among respondents in each group was consistent. She also found that answers were not dependent on the respondent's background - lay person or expert - and was therefore able to encapsulate the research findings for each bay in two damage schedules - one for resource losses and one for damaging activities.

In both Ban Don and Phangnga Bays, clear-cutting of mangrove forests was considered to be the most important loss by all respondent groups. However, the importance of activities causing this loss differed in each area. Shrimp farming involving clear-cutting was ranked first on the Ban Don Bay activity schedule, while hotel development involving clear-cutting was top in the Phangnga Bay schedule. This reflects the experience of the residents of Ban Don Bay with shrimp fishing and the importance of tourism in Phangnga Bay.

According to Chuenpagdee, the broad similarity of results from the two case studies, conducted in two coastal areas with different characteristics, suggests that the method is reliable. It is given further credibility by the fact that differences in the resource characteristics and the economic importance of resources in the two coastal areas were properly captured in the schedules.

To further validate the findings, an attempt was made to obtain monetary values of the resource losses using the same paired comparisons method. Respondents were asked to choose between a resource loss and a loss of money. A considerable number (48% in Ban Don Bay and 35% in Phangnga Bay) were not willing to make any trade off between resource and monetary loss. However answers received from the rest of the respondents gave monetary estimates which reflected the rankings obtained in the main research.

In the case of Ban Don Bay, the damage schedule indicates that according to the public's judgment, clear-cutting of mangrove forests and shrimp farming activities that involve clear-cutting of mangrove forest are of high importance. In this case, Chuenpagdee concludes, the policy might be to prohibit clear-cutting of mangrove forests for shrimp farming, and to apply a user fee for shrimp farming that does not involve clear cutting.

While this first trial was encouraging, Chuenpagdee recommends further research to improve the reliability, validity and credibility of the method. More also needs to be done to test its applicability in real (as opposed to hypothetical) policy settings.

January 1999

The full text of this study is available as an EEPSEA Research Report:
Damage Schedules for Thai Coastal Areas: An Alternative Approach for Assessing Environmental Values - Ratana Chuenpagdee

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