

## **Valuation of Natural Resources and Environmental Degradation: A First Step to Conflict Resolution**

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**As** natural resources and the environment have become rapidly degraded, conflicts among people themselves and between people and government agencies have become daily newspaper headlines. In the month of April 1995 alone, local newspapers featured at least three major conflicts.

First, the conflict over the proposed dam construction in Phrae Province, between local villagers and government authorities. This project was to be funded by the World Bank but the physical hostilities expressed toward the World Bank representatives who came to visit the villages that would be inundated by the reservoir led the Bank to drop the project. The Thai government has decided to go ahead without the World Bank's support but the feasibility study and its environmental impact assessment (EIA) are yet to be approved by the National Environment Board (NEB). The Royal Irrigation Department (RID) complained that the NEB has delayed the approval of EIA for a proposed dam in Phrae Province.

The second major conflict that has appeared in news recently is between villagers in Chiang Mai and a government consortium consisting of the Chiang Mai provincial government, the Chiang Mai municipality and the Electrical Generating Authority of Thailand (EGAT). The consortium is trying to locate a site for its proposed power plant which would use garbage and coal as fuel, but their attempts are resisted by villagers, wary of Chiang Mai municipality's earlier acts of garbage dumping in the open.

The third major conflict relates to the request by villagers in Chiang Mai to allow them to reside in protected areas where they have lived for generations. Apart from these major conflicts, minor events such as disputes between upstream and downstream water users are so common that they no longer feature in newspapers.

All of these conflicts are related to competition for natural resources or to environmental degradation. Often, villagers gathered to put forward demands to the government to stop proposed public policies which are evidently economically beneficial to a larger number of populace. Acts of effigy burning or marching to city centers to voice demands have sometimes been considered by the "urbane" onlookers as disturbing or unruly activities. Some have even gone further to believe that anarchy has ruled and blame the government for being too weak to take proper measures to control these vocal villagers. Others consider that these activities are political maneuvers designed to topple the ruling government.

The so-called "public hearings" are sometimes held in Thailand to justify or to abandon a project. As the way they are organized in Thailand, these "public hearings" are seminars, attended usually by the majority supportive of one side of the stake-holders, i.e., the government agencies, the NGOs. Data are often picked to best suit the organizers' interests. NGO support is seen as crucial by the groups protesting against a government project or policy. When such a group lacks strong support from NGOs, who can provide some anecdotal evidence of hardship, it has virtually no evidence to support its claim for damage.

Why do few people feel generally sympathetic with such protesting groups? The answer is simple. The damages that these people would have to suffer are not obvious, while the benefits from the development and environmental projects are clearly evident. While the majority who would benefit from these projects are usually silent, the minority who suffer becomes vocal.

A proper valuation of natural resources and environment degradation could help in making damages and a range of policy options explicit to administrators and policy makers so that appropriate compensations could be designed.

The following are the two case studies conducted by Thailand Development Research Institute (TDRI) in collaboration with Harvard Institute for International Development.

### **MEASURING THE COSTS AND BENEFITS OF A NATIONAL PARK: A CASE STUDY OF KHAO YAI**

Protected areas such as a national park provide a long list of benefits: biodiversity, carbon sequestration (storing atmospheric carbon dioxide as biomass and, thereby, helping to reduce global warming), watershed protection, recreation and tourism, to name the major ones. These benefits accrue not only to the current generations of domestic residents, but also to future generations of both local and non-local residents. Indeed, benefits such as biodiversity and carbon sequestration could be global in nature.

The desire to set aside wilderness or protected areas is not generally upheld equally by every citizen. The more educated and economically well-off an individual is, the greater is the desire and willingness to invest in protected areas, because such an individual could appreciate a broader range of direct and indirect use values as well as option and existence values. An educated and economically well-off individual may also have broader experience and knowledge at his/her disposal, and have more opportunities to benefit directly, e.g., tourism, and indirectly from protected areas.

There are also costs associated with the establishment of the protected areas: the actual cost of setting up a park and the costs of its maintenance and protection. These costs are evident and generally covered in government budgets. However, there also are hidden costs or opportunity costs to villagers who would have to cease harvesting forest resources from the protected areas.

TDRI's case study of the Khao Yai National Park, which is Thailand's first and most popular national park, revealed that income from forest resources that villagers around the park had to forgo ranged between 10,000 and 20,000 baht per family. The families would have derived this income from a variety of products, such as timber, fuelwood, fruits, vegetables, medicines, wildlife and aromatic wood, which they could have obtained from the forest if it were not protected. The net present value of the forgone harvests for the 200 villages around Khao Yai is estimated at 1,650-3,300 million baht.

According to the same study, the gain, measured by the 'willingness to pay' to protect Khao Yai by those who value the establishment of the National Park, is much larger. The net present value of Thai urbanites' willingness to pay to protect Khao Yai amounted to 30,000 million baht.

If similar studies could be undertaken for other projects over which conflicts have raged, policy makers would be better able to understand problems of the people affected and design appropriate assistance measures.

### **MEASURING THE COSTS OF WATERSHED MANAGEMENT**

In many countries, water is treated as an "open-access" resource, i.e., it can be extracted on a first-come, first-served basis and in as much quantity as the available labor and equipment would permit. Under such circumstances, water usually belongs to those who have geographical advantage or those who have more capital, power and labor resource at their disposal.

In the above situation, water is treated as a free good. In actual fact, water is not free. The use of water has its own opportunity cost. Water extracted by upstream farmers would not be available to their downstream counterparts. Water not used by the agricultural sector can be made available to cities or industries. The opportunity cost of water is the value of water in its best alternative use.

Water conflicts in Thailand have become increasingly hostile and complicated (TDRI 1995c). In the past,

upstream-downstream conflicts were common. Increased agricultural activities in the upland areas have brought about highland-lowland conflicts. As demand for water from urban areas increases, inter-basin transfers pose another area of potential conflict. Lack of legal clarity and slow action by the authorities have exacerbated and added to many water conflicts in Thailand. Although the authorities may agree to the protesters' claim of having suffered losses, they would less readily agree to the protesters' demands for compensation or corrective actions, since the actual extent of damage would not be obvious to them.

TDRI's studies (TDRI 1995a, 1995b) of water value and water conflicts deal directly with this problem. In a study of the economics of watershed management in Mae Taeng, changes in land use in the highland were indicated as one possible explanation of the decline in stream flow during 1972-1991. The sustained decline, even after having taken into account the effects of the variation in rainfall, amounts to 2.7 million cubic meters per year. The TDRI study estimated that had this amount of water not been lost, benefits from the Mae Taeng irrigation project would have increased in a range of 26 to 93 million baht per year. Over the period, the area of irrigated agriculture in the Mae Taeng irrigation project was reduced from over 100,000 rai to about 40,000 rai.<sup>1</sup>

The activities which have led to increased water consumption in the highlands are rapid urbanization, irrigated agriculture and reforestation. For reforestation, evergreen pines species have been used to replace swidden agriculture, grassland and dipterocarp or mixed pine-dipterocarp forests, which require less water in the dry season.

Lowland farmers have reacted to resource depletion by changing the second crop from rice to soy bean. Observing the trend of dwindling resources, many have opted out of agriculture. The land boom toward the end of the 1970s made the transition easier for some, but not for most. Rapid urbanization and industrialization have boosted strong demand for labor, and commerce and industry now provide a new venue for employment.

The damage for the lowland farmers would have gone unnoticed if this study has not been undertaken. Villagers did not protest, in this particular case, because some farmers thought that their plight was a result of the vagary of nature. For others, there were the exit options elaborated above. Besides, the Mae Taeng watershed is a long watershed stretching nearly 72 km north-south from the Thai/Myanmar border. The sheer distance renders matching of causes and effects difficult. By contrast, the lowland villagers in Chomthong, another district in Chiang Mai, noted the possible effects of highland agriculture more readily because the Mae Khan Basin in which their village is located is much smaller. Lowland villagers in Chomthong have requested the government to move the highland farmers away from the upper watersheds.

The preceding arguments do not imply that lowland farmers should have priority rights to natural resources or that highland development and highland development projects should cease. What I would like to emphasize is that, first, the benefits and costs should be made more explicit and transparent to the public before a decision is made. Alternatively, a system could be created so that everyone pays the full cost of the resources they exploit. This full cost will have to include the opportunity costs and the costs inflicted on others who are not otherwise fully compensated. Second, nature conservation projects, no matter how well-intentioned they may be, could by themselves have other environmental impacts. Highland sedentary agriculture development projects designed to stop shifting cultivation, and reforestation programs, may be effective in reducing soil erosion and restoring forest cover, but at the expense of another resource—in this case, water. Third, valuation of damages is an essential first step to understanding the magnitude of hidden costs.

As these costs are revealed, policy makers and administrators would be in a better position to rank cost and benefits of different stake-holders, some of whom would have been paying double losses: first, the loss of income and employment from resource depletion, and, second, extra costs they have to shoulder from having to seek alternative income and employment. Without this attempt, the people who suffer natural resource and environment degradation will be forced to feel that they are fighting a losing battle and may resort to using political pressure by converting local issues into national issues. Another CIDA-

funded study (TDRI 1995c) shows that while political compromise could be effective at the village level, it tends to be inconsistent, unaccountable and unstable at the national level, because of the need to settle the issue quickly.

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