BARRIERS TO IREM IN THE MEKONG RIVER BASIN

The concepts and requirements of integrated resource and environmental management (IREM) are an ideal that all countries may hope to someday achieve in their resource management strategies. In reality, many barriers exist to the establishment and implementation of IREM in the countries of the Mekong River Basin (MRB) as in countries worldwide. These barriers may be in the form of scientific uncertainty, economic constraints, institutional constraints or social and cultural constraints.

SCIENTIFIC AND TECHNICAL

Science and expert opinion are essential in order to make sound environmental management decisions. However, too narrow a focus on the outcomes of hypotheses testing and data analysis may undervalue other important tools, such as public opinion or traditional knowledge of an ecosystem or resource. As we saw in the discussion of uncertainty, good resource management policy must acknowledge and have ways of addressing scientific limitations.

Science has some major limitations that should be considered in the overall implementation and evaluation of an integrated resource management plan. Current world technology is becoming increasingly specialized; science and engineering are both very reductionist fields, and they are the source of most technological advances. Reductionist refers to the separation and distillation of complex problems into individual variables, each of which can be tested. While very accurate knowledge can be obtained on the characteristics of each variable, the effect of all the variables as a whole and on one another can sometimes be ignored.

Sole reliance upon science also runs the risk that the community will not support the preferred management approach. While scientific validity is essential, the successful implementation of resource policies is also largely dependent upon their congruency with public sentiment. However, an expanding public arena has resulted in less confidence being placed on professional technical expertise and greater demands for community involvement in the decision-making process. As a result, scientific backing is no longer a guarantee of public endorsement.

Conventional scientific practices are also limited in their ability to address problems at the ecosystem level solely from a technical perspective. For instance, an absolute scientific diagnosis of ecosystem health is highly unlikely, especially in large, complex water bodies. Conventional technical approaches evaluate the environmental status of specific areas based on comparisons of conditions at the site of interest with conditions at undisturbed or reference areas. This technique has proved useful for evaluating discrete site-specific developments, such as pulp mill operations and mining practices. However, this technique is difficult to

apply in an evaluation of conditions of entire water bodies or other ecosystem types for a number of reasons, including:

- The scarcity of unmanaged, undisturbed sites for use as reference sites
- The multitude of possible sources of disturbances that exist in the context of natural ecological changes
- The limited understanding of ecological systems and human influences.

A second evaluation method is the use of indicator species as surrogate measures for assessing the health of certain media, such as water. However, by measuring discrete system components, this approach is also limited in its ability to assess ecosystems in their entirety. The lack of sufficient long-term trend data also means that it is difficult to interpret results and identify when effects are significant.

Integrative science is needed in natural resource management to put new knowledge into a larger context, one that can guide resource use decisions. Sometimes this blend of scientific disciplines can be difficult to achieve, as specialists in one discipline (such as chemists) may be uncomfortable working with specialists from another discipline (such as fisheries biologists). In addition, sometimes specialists in one field may have trouble determining whether evidence from another discipline is credible. In IREM, achieving a perfect integration of all technical disciplines may not always occur, but it should be the goal when designing a resource management strategy.

ECONOMIC

Economic barriers to IREM are plentiful, as IREM takes a considerable amount of time, and time means money. Many government agencies and institutions in the MRB may not be able to fund the time necessary for developing a long-term integrated resource management program.

In addition, developing countries in the Basin aspire to similar standards of living that exist in developed regions, like Europe and North America. This is a completely understandable economic goal. However, short-term, intensive exploitation of natural resources should not be considered as the only means of achieving this goal. North America and Europe have certainly made some major commitments of natural resources that do not protect the abundance and genetic integrity of the resources. In addition, pollution of some resources beyond their ability to assimilate wastes has resulted in permanent degradation of those resources. Many areas of the MRB are not yet seriously degraded. It would seem prudent for the people of the Basin to learn from some of the mistakes of the developed countries and not make those same mistakes in the use of their own natural resources.

Like many developing countries, MRB riparian countries may find it difficult to turn down the profits from large short-term harvests. The revenue generated by clear-cutting an entire patch of forest will certainly be higher than if the site is harvested over a longer time period and the ecosystem given a chance to recover from some of the impacts of logging. In addition, protective measures like erosion control and reforestation of logged areas cost money. Governments, environmental managers and the people of the MRB countries need to

decide that the added costs of wise natural resource management are an investment they are willing to make.

INSTITUTIONAL

Institutional barriers to IREM in the MRB are often due to incompatible political and governmental processes and priorities. In fact, such institutional limitations are common to many governments, whether in developing or developed countries. Legislation is often fragmented, with different government agencies and departments managing different resource sectors, like wildlife, fisheries and forests.

Divisions in government by resource area, territory, and length of management focus are based predominately on policy mandates with little relevance to ecological requirements. Considered independently under relatively narrow mandates, each agency is responsible for addressing only certain aspects of a problem. Since environmental issues may affect more than one resource directly or indirectly, responding to issues within conventional institutions often results in the transfer of problems from one aspect of the environment to another, creating other problems. The same is true for different management areas. No mechanisms exist to address specific issues that fall outside of well-defined compartments or to address broader concerns that transcend single resource areas or affect multiple management areas. Moreover, such a management strategy often lacks a process for addressing cumulative and synergistic effects.

With fragmented resource management, data collection may be redundant, and adequate mechanisms for information sharing may not exist. The end result is that each resource is managed comparatively independently. Any issues or ecological processes that fall outside of standard management areas may be ignored. In addition, a government agency may be required to enforce environmental legislation, but may not be given adequate financial or technical support. Thus, while environmental protection policies and legislation may exist, the implementing agencies may not be effective.

Broader concerns that transcend single-species or resource management are often ignored. Consider this example. A pulp and paper mill that releases effluent into a receiving water body may be well below a country's national water quality criteria for chlorinated organic compounds such as dioxins and furans. In this situation environmental managers might be inclined to think that the effluent discharge is not causing any adverse environmental impacts. They may be wrong. To provide a more complete understanding of potential impacts, body tissue of the organisms such as fish in the receiving environment should be sampled in order to determine whether they are absorbing the dioxin. Such a sampling program would require the efforts of a number of different specialists, possibly from several separate environmental management agencies. Institutional constraints, however, may mean that such a fish or invertebrate monitoring program is never implemented and incomplete understanding of impacts persists.

SOCIO-CULTURAL

Despite theoretical ambiguity and lack of clearly defined operational models, many environmental agencies have introduced ecosystem management approaches. Review of

these attempts indicates that social and cultural barriers can significantly impede management attempts. Most notable is the lack of appreciation for, and development of, interdisciplinary expertise. This is exemplified in the sharp division that has been made between natural and social sciences. As a result of society's entrenched use of disciplines, problems are often inappropriately defined and framed in discrete compartments such as being seen as an economic problem or a fisheries problem. Lack of interdisciplinary expertise has also restricted the knowledge base and tools available for attempting holistic approaches such as ecosystem management.

Problems are also commonly inappropriately defined as a result of society's over reliance on science and expert opinion. This science-based, expert-centered management style remains a cornerstone for environmental management today. However, while an essential component, science and expert opinion alone are insufficient for making and implementing ecosystem management decisions.

One of the main consequences of overly relying upon science is the tendency for management to narrowly frame environmental problems in technical terms. Unable to attach significance or value, science cannot on its own define a management ethic, evaluate trade-offs or distinguish between alternatives. Rather, the process of attaching meanings to scientific observations relies on the assertion of human values. For example, where science will note that a 500 mL container has 250 mL of liquid, the question of whether the cup is sufficiently full is based solely on value judgments. The same argument is made in answering environmental questions, such as, how much pollution is acceptable? Expressions of ecosystem health and integrity ultimately depend upon personal views of human-nature relationships.

Ironically, while management tends to narrowly frame environmental problems in ecological terms, social values are often at the root of the high degree of controversy surrounding environmental issues. Although there is usually considerable concern about environmental degradation, there is much less agreement on the kinds of values by which to guide decision making. Resource management is predominately a reflection of how people think about resources. Some general terms used to illustrate the range of views that exist on human-nature relationships include the following:

- **Exploitist** – nature in its purest form is valueless and only becomes of value once human's fashion cultural objects with its virtually limitless raw materials
- **Utilist** – natural productive processes that provide useful resources and assimilative processes that address wastes are of value and should be protected
- **Integrist** – all natural phenomenon are important and human culture must be adapted to natural processes to ensure the persistence of these processes
- **Inherentist** – nature has value beyond any use to humans.

These categories demonstrate the diversity in values that exists in human-nature relationships. Reconciling these differences is often the fundamental challenge of environmental management. Consequently, when environmental problems are defined solely in scientific technical terms, solutions and strategies often fall short of addressing the root cause of environmental problems and thus are limited in their effectiveness.

The political process of many MRB countries (and of many developed countries as well) is oriented more toward polarized issues, such as individual species management, rather than IREM. Time periods are shorter and priorities can change when political leadership and attitudes change. Rapid changes in government often reduce continuity of resource management programs and can result in dramatic changes in policy direction and result in a re-shuffling of priorities with the environment often being viewed as less important.

A long-term outlook and management for the future are two fundamental components of IREM, yet they can be difficult to achieve. Societies of many developing countries generally are geared toward growth, rather than maintenance. There is pressure to address poverty issues, even at the cost of the environment and society over the long-term. The attitude of 'what has the future done for me?' is commonly adhered to in many countries, both developed and developing. Why live to protect the future when the current generation will not receive any 'direct' benefit? The desire to manage and protect a country's natural resources for the continued use of its children and grandchildren will have to be understood and embraced before IREM can be implemented effectively.

Finally, a society's overall attitude toward change may not be compatible with the implementation of integrated resource management. Traditional environmental policy and subsequent protection regulations often are developed in response to crisis. Change in environmental management and in individual's lifestyles needs to come when environmental problems are more manageable, not just when the situation is critical and a society is in danger of losing a resource or becoming ill as a result of poor resource management.