

1 Conclusions

Ecological compatibility of technologies with local site conditions is fundamental to success of development assistance: Development assistance organizations know that the specific sociocultural, political, economic and ecological conditions of a development site create the framework into which their efforts must be integrated. Each of these will affect the sustainability of the development project. Regardless of the cause of resource degradation or damage, developing countries generally cannot afford even a temporary decline in food or foreign exchange derived from their natural resources, and they lack sufficient economic resources to implement reclamation or restoration activities. Thus, selection of ecologically appropriate technologies becomes imperative.

Why unsustainable technologies may be chosen: Most developing countries are located in tropical latitudes where, at many sites, few if any sustainable technologies exist to satisfy development needs. So technologies that worked elsewhere under different conditions are chosen and some of these prove unsustainable. When technologies developed for temperate areas are transferred without appropriate modification to tropical areas, they tend to disrupt ecosystem functions beyond natural regenerative capabilities, thus reducing the land's current and future productivity y. Sustainable technologies, in other cases, do exist and have been demonstrated, but are rejected in favor of approaches that are

expected to achieve other, overriding goals. Finally, no single individual is likely to have adequate technical knowledge to assess thoroughly whether a proposed technology will be compatible with the political, cultural, economic, and ecological conditions of the development site. Experts responsible for informing decision makers sometimes are unable to recognize which technologies will be sustainable. Thus, technologies may be promoted based on “best guesses,” which sometimes are wrong.

Need for continued congressional oversight: Selecting technologies expressly to fit ecological conditions is becoming an important component of development assistance strategy at the U.S. Agency for International Development (AID). Similarly, the multilateral development banks (MDBs) have strengthened their capabilities to foresee and mitigate adverse environmental impacts from the projects they sponsor. These changes largely are reactions to pressure from Congress and other concerned organizations. Several initiatives at AID, and the environmental goals recently articulated by the President of the World Bank, suggest that the importance of ecological sustainability is becoming an accepted value for development assistance professionals. However, bureaucratic inertia seems to work against substantial improvement in the agencies’ abilities in this regard. Therefore, continued pressure from Congress is needed to assure progress towards a goal of ecologically sustainable development.

Congress has a direct and profound influence on AID. Indeed, changes in AID’s authorizing legislation and appropriations have contributed to a proliferation of high priority goals so numerous that they

are widely perceived as a serious constraint to the agency's effectiveness. Thus, Congress is faced with a dilemma. "Micromanaging " AID by increasing the specificity of development objectives in the Foreign Assistance Act and earmarking shrinking development assistance appropriations for specific purposes--may inhibit the agency's ability to develop and carry out efficient development assistance programs. Without pressure, on the other hand, AID may be slow to progress in integrating an environmental perspective in agency activities.

An alternate solution may be modified use of congressional oversight. This could include enhancing the capabilities of committee staff by adding additional personnel experienced in development assistance and technology development, and fostering improved collegial and informal working relationships between committee staff and AID personnel. Congress or AID could undertake a study of how congressional pressures are perceived within AID, and what mechanisms could improve productive interaction.

Attitudes at the top: Improvements to assure that promoted technologies are ecologically appropriate seem unlikely to occur on the scale needed without high-level management personally committed to this goal. Thus, congressional confirmation hearings--in which a candidate's capabilities and views are assessed--are an important mechanism to influence AID activities. Confirmation hearings provide an important opportunity for Congress to raise issues and to discern the depth of a nominee's knowledge of and concern for matching development projects and technologies to local conditions in developing countries, and are an

appropriate place to reinforce the guidance given in oversight hearings and legislation. Careful attention should be focused on the personal knowledge and attitudes of a proposed AID Administrator, and on his/her criteria for selection of Assistant Administrators. Agency recruitment policies and practices, that ultimately affect the agency's ability to perform its mandate effectively, largely are determined at the Assistant Administrator level.

Congress does not formally influence the choice of officials in multilateral development banks, but it does approve appointments of Treasury Department officials who represent U.S. interests to the banks. Members of Congress probably can have a significant impact on selection of the top bank officials through informal communication with the Administration.

Having enough of the right people: Environmental science is a technical field based on scientific principles, knowledge, and tools that cannot be used effectively by persons without appropriate training and experience. Neither AID nor the World Bank has a sufficient number of environmental officers to assure agency-wide guidance. Just as a development agency needs the right set of economists to design a commodity pricing intervention, it needs the right set of specialists to design and execute a successful intervention in the use of natural resources. Further, periodic accountings of natural resource conditions and environmental quality indicators to accompany reports of recipient

country economic indicators prepared by development assistance organizations could provide a way to motivate these people to address carefully the match of technologies with ecological conditions.

Organizing technical skills: In addition to having an adequate number of people with needed technical expertise and fostering their collaborative work, it is necessary to ensure that these staff occupy appropriate positions in the organization so that they can provide needed expertise at the right times in the project cycle. Although environmental and natural resource expertise is integral to all stages of project development and implementation, particularly important stages are:

- 1) problem/opportunity identification,
- 2) contractor identification and selection for project design,
and
- 3) project monitoring and evaluation.

Thus, interdisciplinary teams might be established in AID to link the U.S. science and technology community with field activities, and to serve as a technical filter assuring that AID would be unlikely to select and transfer unsustainable technologies to developing countries. Each team would be charged to assist with evaluation, redesigning, or designing agency activities in one of several ecological zones common to developing countries (e.g., hot wet lands, arid/semiarid lands, and high altitude lands). This would increase the likelihood that technologies chosen would fit the ecological setting of the development site.

Interdisciplinary analysis: The systems in which AID projects intervene are complex and changes are likely to result in cross -sectoral conflicts. Thus, the tasks of pre-project analysis and project evaluation usually require the knowledge of several types of specialists--such as sociologists, ecologists, and soil scientists--as well as the experience and knowledge of local people who represent the sector to be affected. The analytical methods for bringing this information together for presentation to engineers, economists, and decision-makers is the specialty of environmental analysts. Thus, adequate planning often necessitates use of interdisciplinary teams guided by environmental analysts. However, teams of consultants and staff fielded by development assistance agencies too seldom accomplish this. Project officers generally have neither the correct technical backgrounds nor ready access to sufficient in-house technical personnel to facilitate adequate interdisciplinary environmental analysis.

Interdisciplinary cooperation seems unlikely to occur without staff incentives and an organization structure explicitly designed to encourage such teamwork. The development assistance organizations might increase their support for development of interdisciplinary planning and analysis expertise, and expand support for development of techniques that might facilitate and streamline interdisciplinary planning.

Improve project planning and increase project flexibility:

Assistance projects that intervene in a developing country's natural resource base require careful and perhaps extensive planning. In most cases, the scientific knowledge base is from temperate regions whereas the

development site often is tropical. Further, the recipient culture and economy tend to differ substantially from those of the project designers, making it difficult to predict what types of projects are likely to be adopted. Most development projects, then, are at least in part experiments and must be designed to accommodate unidentified changes.

Risks to natural resource systems and development assistance recipients may be reduced where projects include an extended technical planning phase, a gradual phasing-in period for adaptation of technology to the site's ecological and social conditions, and have a length commensurate with achievement of results despite likely mid-term project realignment. However, internal organization goals, to keep funds moving and to achieve measurable results quickly, operate against these approaches. Further, short project duration makes it difficult to introduce technologies or implement projects gradually, and presents a serious obstacle to making mid-term corrections in response to monitoring and evaluations. Instead of today's common three- to five-year AID projects, durations of 10 to perhaps 20 years seem more appropriate.

Improved use of project evaluations: Midterm and final project evaluations are little used to improve AID and World Bank technology decisions. Even when evaluations are broad enough to observe external effects, and are conducted long enough after project completion to determine ecological sustainability, evaluations seldom address faults with the original problem identification and project design. Yet, this is the time when, with the benefit of hind-sight sharpened by project experience, important lessons can be learned.

Analysis of existing evaluation reports could identify important environmental and cultural interactions that determine whether technology interventions will be maintained after the project is completed. Evaluation procedures could be modified to improve identification of causes of development project success and failure and to assess effectiveness of environmental mitigations proposed during project planning and midterm evaluations. In addition, evaluations could be designed to create a feedback system for project officers and design teams.