
COOPERATIVE REGIONAL DEMONSTRATION PROJECTS: Environmental Education in Practice

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Abstract

Environmental problems in Africa and elsewhere in the tropics are outpacing the many efforts to solve them. A more concerted and accelerated international effort must be mounted to help these countries solve their growing problems. This has to be done soon for natural resources are now being lost forever. The message was the same when the MAB program began in the early 1970s. It is now all the more urgent.

Can we now put our environmental education into practice to develop a more effective program? The Biosphere Reserve Project offers a sensible approach to the solution of conservation and resource management problems. Building upon this a system of "Cooperative Regional Demonstration Projects" using biosphere reserves as the focus of integrated projects on a regional ecological scale is proposed. These projects are defined and a pilot project in Rwanda is described. It is proposed that international organizations and countries join in a planned effort to develop these Cooperative Regional Demonstration Projects, especially in the tropics and subtropics where the greatest diversity of life occurs.

Introduction

The major environmental problems of many countries, especially in the tropics and sub-tropics are outpacing the efforts to solve them. This situation has been characterized in Kenya (Baker and Kinyanjui, 1980) as an "increasing, horrifying, long-term loss of natural resources for short-term returns" and one that was likely to get worse unless there was "concerted national action organized and expressed right down to the users of the country's resource base."

In my observation in East Africa there have been great changes in the last 20 years including conversion of forests and other vegetation types, extensive soil erosion, destruction of marine habitats and an increase in pollution. These conditions, of course, are not unique to Kenya. Kenya is probably better equipped and organized to deal with environmental problems than most countries in Africa. The extent of environmental problems has been well categorized in reports such as *Tropical Forest Resources*, (FAO 1982); *Ecological Aspects of Development in the Humid Tropics* (National Research Council, 1982); and *Research Priorities in Tropical Biology* (National Research Council, 1980).

We must agree that a more coordinated and effective international effort is needed. What can be done that would improve upon the past international initiatives? I believe the MAB Program and the biosphere reserve project, offers a proven and useful approach. With considerable investment by governments over the last decade, and many years of thought and effort by some of the world's leading scientists, resource managers and government officials, MAB has developed appropriate structures and principles that have been tested in many areas around the world. Among the essential characteristics, (DiCasteri, Hadley and Damlamian, 1981) are:

- Research on resource management problems in particular geographic areas.
- Interdisciplinary approach involving both the natural and social sciences.
- Participation by local people, planners, scientists, resource managers and politicians at all stages and levels of a project.
- International cooperation in research, management and training so that the collective effort can address a range of interrelated problems.

Along with the development of these characteristics, the network of biosphere reserves was developed to serve as representative sites for conservation, baseline studies, and education and training. The Task Force that prepared the criteria and guidelines for the choice and establishment of these reserves (Unesco 1974) described the concept "as an approach to maintaining the integrity of biological support systems for man and nature throughout the whole biosphere." Following this grand theme I suggested that biosphere reserves (and other protected natural areas) should involve not only preservation, but include the research and monitoring of human activity to determine which actions are compatible with maintenance of viable ecosystems, and which actions must be changed (Gilbert 1976). Batisse (1982) described the usefulness of the biosphere reserve and how it has developed as a tool for conservation and resource management. There are also examples of biosphere reserve projects that show how effective this tool could be in the future. These examples point the way to putting our collective environmental education and MAB experiences into practice by developing "Cooperative Regional Demonstration Projects."

Cooperative Regional Demonstration Projects

A Cooperative Regional Demonstration Project (CRDP) applies the principles and characteristics of MAB and uses a biosphere reserve as a focus.

- It is cooperative in that it involves participation of local people, scientists, resource managers, planners and policy makers. It is cooperative in that it includes the planned

use of the best expertise and resources of various donor and technical assistance programs and agencies, in several countries.

- It is regional in that it focuses on a specific and definable geographic region which is characterized by the types of ecosystems it contains and the sets of resource use practices and problems associated with those ecosystems.
- It intends to demonstrate both environmental problems and their solutions using particular sites in the region, emphasizing local participation in the demonstrations and an organized program of environmental education and training. The objective is also that these demonstrations become models for regions facing similar problems.

Two MAB projects, in particular, have influenced the development of the CRDP:

1. Durango, Mexico Biosphere Reserves

Two biosphere reserves, La Michilia and Mapimi in Durango, Mexico illustrate how scientists, politicians, and local people can work together to improve conservation of natural resources of a region and at the same time raise the economic and social level of people living in and around the reserves. This has been achieved under the leadership of Dr. Gonzalo Halffter and his colleagues in the Institute of Ecology in Mexico. The "core" areas or integral parts of the biosphere reserves were purchased by the Regional Government in Durango, but owners of private estates and the peasant farmers on the collective farms are voluntarily helping to protect the integral parts of the reserves as well as cooperating with the scientists to improve the uses of the resources of the region.

For example, experiments have been conducted in La Michilia in the joint exploitation of deer and cattle, and apiculture has been developed from the experimental to the production stage (Halffter 1980). Exchange of information and personnel has been developed with the US, pairing the Durango reserves with counterpart areas in Arizona, to the benefit of both countries.

After visiting the La Michilia Biosphere Reserve and observing first hand the working relationship between the Mexican scientists and the local people, I used the La Michilia example in Honduras where the Government was considering establishing a biosphere reserve in the Platano River Region. The Rio Platano Biosphere Reserve was later established and a management program which incorporates the local population in the protection and development of the area is being carried out (Glick 1983). I think Dr. Halffter has proven what he has said: "It is not Utopian to believe that new strategies for ecological development can spring from the reserves: on the contrary, this is an objective of no less importance that the conservation of the germplasm" (Halffter 1980).

2. Integrated Project in Arid Lands (IPAL) and Mount Kulal Biosphere Reserve in Kenya

This project well illustrates a sound, scientific approach to planning land management. The project was set up in 1976 in Northern Kenya to determine the causes and effects of desertification and to develop plans to reverse the trend (Lamprey 1981). The region chosen was a study area of 22,500 km² between Lake Turkana and Mount Marsabit. The area is the home of the Rendille pastoralists, and includes Mt. Kulal, a Biosphere Reserve. Over the past seven years, basic information has been compiled on the climate, soils, water distribution, vegetation, wildlife and domestic livestock; and on human populations and their economic, social and cultural characteristics.

The project is now entering the management phase with an excellent basis of scientific information and an understanding of the causes and effects of desertification. It is a model of sound research and planning, but implementing the management phase will be difficult for it involves certain modifications of the traditional animal husbandry practiced by the Rendille. Therefore, emphasis is being placed on the participation, education and training of the pastoralists, and on demonstrations of the alternative practices. The IPAL experience is a useful model for other countries facing similar desertification problems.

3. The Ruhengeri Pilot Project in Rwanda

The two projects described above particularly influenced the development of plans for the first pilot CRDP being planned for the Ruhengeri Prefecture in Rwanda. The project was initiated this year at the request of the Government of Rwanda and the US Agency for International Development (USAID) mission in Rwanda, in cooperation with the Environmental Training and Management in Africa (ETMA) project. (ETMA is a USAID funded program carried out by the Southeast Consortium for International Development.) The project design has been prepared by a multidisciplinary team led by Dr. Frank McCormick of the Graduate Program in Ecology, University of Tennessee, in cooperation with Rwanda scientists and officials. The region, in northwest Rwanda, includes productive agricultural land but also high population densities, intensive land use and severe soil erosion. The mountain forest, included in the Virunga Volcanoes National Park, a proposed biosphere reserve, is the source of the country's most important watershed, which has not been fully calculated or understood. The forest is also, most notably, the home of the mountain gorilla, *Gorilla gorilla berengei*, an endangered species and a unique resource for the world. If the natural resources continue to degrade at present rates they will be unable to support the population by the year 2000 (USAID, 1977).

Therefore, the goal of the CRDP is to assist the Government of Rwanda to demonstrate that these problems can be solved. If Rwanda, with its limited land resources and one of the highest population densities in Africa can demonstrate the necessary action to reverse these trends it would be a very useful model

for other countries as well as providing significant national benefit. The CRDP intends to:

- assess major environmental problems and trends in the region and the resources to help solve these problems
- inventory the physical, biological, human and socio-economic resources
- plan and develop a structure within the Government to coordinate integrated resource management activities
- integrate other technical assistance projects in the Ruhengeri Prefecture including cropping systems (small farm systems) and tree planting projects proposed by USAID
- develop demonstration sites in the Prefecture which apply the most appropriate technologies to the solution of specific problems.

A Proposal to the Biosphere Reserve Congress

A number of significant outputs are expected from the Sessions of the Biosphere Reserve Congress. The following proposal relates to several of these, especially the ones on bringing the biosphere reserve concept to the public and its benefits to the region. It also addresses the expected outputs related to training.

First: Increase support to Unesco, especially for the purpose of encouraging countries in the tropics and sub-tropics to establish biosphere reserve projects. This should be carried out with the assistance of the International Union for the Conservation of Nature and Natural Resources (IUCN), The Food and Agricultural Organization (FAO), and the United Nations Environment Program (UNEP), using their coordinating body--the Ecosystem Conservation Group. This Group agreed (IUCN, 1975) that surveys to select potential reserves would be a joint effort of the Group and that the status of the network would be examined at semi-annual meetings. A number of critical areas in the tropics which should be established as biosphere reserves have been identified by IUCN.

Second: In relation to establishing biosphere reserves, assistance should be given to those countries to inventory their natural resources and train local personnel in the basic natural sciences. This is an urgent need; most technical assistance agencies consider this to be a low priority area without much practical importance! In Eastern Africa, for example, there are only four trained plant taxonomists who can readily identify even a small percentage of the great variety of plant species, or who are knowledgeable about the distribution, ecology, and uses of the plant species. Yet there are probably 9,000 to 10,000 species of indigenous flowering plants found in Tanzania, and approximately 9,000 species in Kenya plus many endemic species in each country.

Third: Assist host countries in the selection and development of several CRDPs by designating and making available to Unesco MAB the necessary technical experts. Also provide support for medium and long-term training of host country personnel in designated institutions. The ETMA project can assist in developing models for this type of training.

The Consultative Group on International Agricultural Research (CGIAR) whose purpose is to bring the resources of modern biological and socio-economic research to bear on agricultural development in the tropics and sub-tropics should be encouraged to collaborate in the establishment of biosphere reserves and CRDPs, for their research centers could benefit from the long-term ecological research carried out in biosphere reserves, as well as from the conservation of genetic materials. One of CGIAR's member organizations, the International Board for Plant Genetic Resources (IBPGR), promotes an international network of genetic resource centers to further the collection, conservation, documentation, evaluation and use of plant germplasm and also supports training in such fields as collection and conservation of plant genetic resources. Discussions have begun between ETMA and IBPGR in Africa about possible collaboration in training and conservation of genetic resources.

It is recognized that these broad proposals face significant obstacles. It is difficult to be "realistic" when concentrating on what might be done, but the problems are serious and growing, so we had better agree to some unusual effort very soon. As Dasmann (1972) pointed out as the MAB Program was first getting underway, "there seems to be no way of speeding the commitments except by public demand from within each nation, and this requires a growing level of awareness not only of the problem but of the means and machinery required for its solution."

This is the challenge, still, in environmental education. The public is more aware now of the problem, but the policymakers are not convinced of the "means and machinery."

As we work to convince people of the suitability of the biosphere reserve approach, it is better to demonstrate how it can work, as has been done in Mexico, rather than to portray biosphere reserves as a new approach opposed to "traditional" conservation, as does the MAB poster on "Opening Conservation to Man." This poster depicts a "sealed jar" reserve in an East African savanna set within a closing vice and this is portrayed as opposed to an "open to man" policy where the jar has broken. This exhibit oversimplifies the problem and does not come close to suggesting a solution. As such it is potentially very damaging to both traditional conservation and to the new approach. Managers of traditional reserves are just as aware as we are of the limitations of their reserves and of the need for the public to benefit from all of the values of the reserves, but these resources are not simply for the use of the people in the surrounding area. The herder's goats would not hesitate to eat

the last rare shrubs in existence if the reserves were "opened to man," but this would be a great mistake for mankind.

The different approaches to conservation need not be presented as opposed to each other. In every case I know of, the biosphere reserve concept could be applied along with traditional conservation.

In the Second Report to the Club of Rome (Mesarovic and Pestel, 1974), the chapter on "Limits to Independence" presents scenarios of the world oil situation. The conclusion is that global cooperation offers much better conditions for all concerned than does the conflict scenario. The authors state that "cooperation is no longer a schoolroom word suggesting an ethical but elusive mode of behavior; cooperation is a scientifically supportable, politically viable and absolutely essential mode of behavior for the organic growth of the world system." One which requires people face up to "an admission that may not come easy. Cooperation by definition connotes interdependence."

The industrialized nations have been and will continue to be dependent on natural resources from countries of the tropics and sub-tropics. But we are generally unaware of our dependence on genetic materials for agriculture, medicines, and industry from these countries. It is time to assess this interdependence and to increase assistance to those countries where the greatest diversity of genetic resources occurs.

The US and the USSR have taken a leading role in the development of MAB and biosphere reserves since their Summit Agreement in 1974 and the development of their bilateral program. The USSR in hosting and in organizing this Congress has done a great deal to advance the MAB Program. We must now agree to develop an action program which would "come to grips with the reality of the situation in the field."

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