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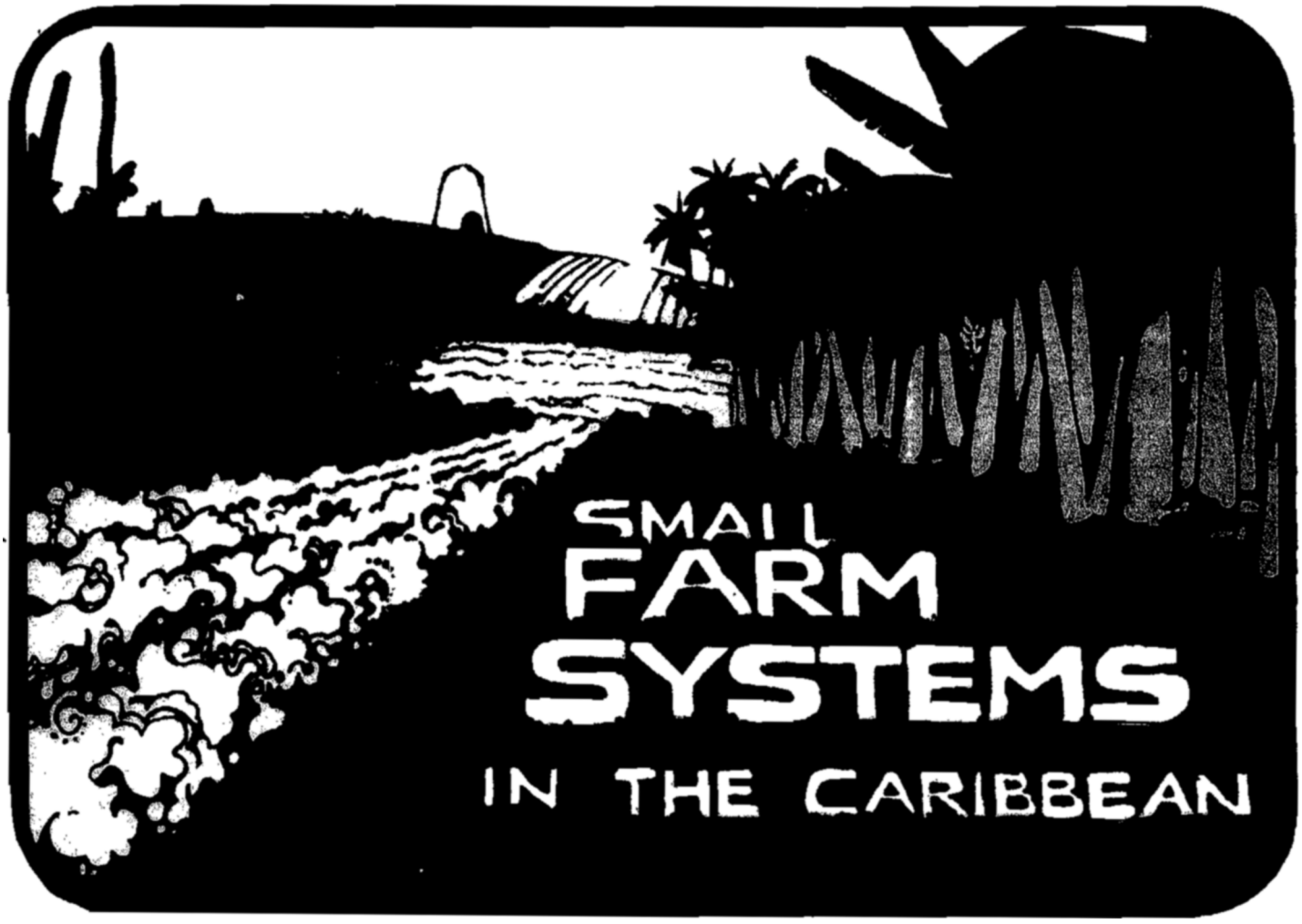

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Farmland Management and Biosphere Reserves in the Lesser Antilles

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The Man and the Biosphere Program (MAB), begun in 1971 under UNESCO, seeks to develop the ability of participating countries to manage and conserve natural resources in line with each country's social and economic features. The Biosphere Reserve on St. John, Virgin Islands has been suggested as the keystone area for a multiple-site Lesser Antillean Biosphere Reserve in the Lesser Antilles. The MAB Program emphasizes environmental training and education, and incorporates an interdisciplinary approach in solving resource management problems in the field. One role of the proposed Lesser Antillean Biosphere Reserve would be to encourage improved agricultural practices by integrating farm management into an overall land use system in each country. The part small farm systems play in the Lesser Antillean ecological scene is an important one. Few countries can afford to lock up major portions of their natural resources from any form of consumptive utilization. Benefits of a Lesser Antillean Biosphere Reserve might include provision for sharing research efforts, restoration of degraded environments, and improved quality of life.
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It is well known that no single land management unit, in an insular setting, can be managed without consideration of the other ecosystems found in the islands. Yet, planners often forget this when considering intensely-managed systems such as farmlands.

The small-scale farms that dominate the scene in the Lesser Antilles are more susceptible to land use practices on surrounding lands, than are their counterparts in the Greater Antilles and on the continents. Obvious undesirable effects include clear-cutting of forests on the slopes of watersheds above farmlands and dumping of harmful chemicals and other pollutants into water supplies used by man and livestock. And, there are many other less obvious but important external threats to consider when land use plans are being prepared.

External threats to farming systems in the eastern Caribbean have not gone unrecognized (Jackson, 1979; Ramdial, 1971). And, as we look for solutions to these problems, one fact is inescapable: there is a need for land use management plans that consider the whole of an island's resources, not just one ecosystem or one land management zone. This need has been recognized, and there are a few useful guidelines for the preparation of multi-system management plans in the Lesser Antilles (Geoghegan, 1983; Putney, 1979).

For the implementation of a successful integrated land use management plan in a particular country, several conditions must prevail:

1. Most importantly, the plan must have the support of the political system governing the country.
2. There must be financial support for the implementation of the plan.
3. The special interests affected by the plan must be willing to subordinate their immediate economic and social well-being to the good of the whole.

Here we are concerned about benefits land use plans hold for one particular system: the food production farm system in the eastern Caribbean. As plans are developed (and they are being developed), it is important that the role of farms in land management plans be given appropriate consideration. All too often we see the driving forces to be preservationists on the one hand and industrialists on the other, with little input from small-scale resource users such as fishermen and farmers.

A Lesser Antillean Biosphere Reserve

There is a relatively new concept in planning for management of natural resources, the Biosphere Reserve. In 1971 the United Nations Educational, Scientific and Cultural Organization (UNESCO) established the Man and the Biosphere (MAB) program. Its purpose "is to develop scientific knowledge with a view to the rational management and conservation of natural resources, to train qualified personnel in this field and to disseminate the knowledge acquired both to the decision-makers and the population of each country" (UNESCO, 1982).

Under the MAB program there are protected areas called Biosphere Reserves. Over 200 such reserves in about 60 countries have been established to date. Criteria for site selection are varied, but the key element is that the Biosphere Reserve is representative of a particular ecosystem type.

In the Antilles, only two Biosphere Reserves have been established, both on islands under the U.S. flag. The Luquillo Experimental Forest in Puerto Rico was designated in 1976, as was the Virgin Islands National Park unit (the latter, however, was not dedicated until 1983). It is recognized that these two units alone cannot represent all of the varied ecosystems (and combinations thereof) existing in the West Indies.

Putney (1983) presents an analysis of the complex factors involved when considering establishment of Biosphere Reserves in the Lesser antilles. Rather than proposing additional Biosphere Resrves on an island-by-island basis, he suggests that a Virgin Islands Biosphere Reserve (encompassing parts of the U.S. and British Virgin Islands), a Leeward Island Biosphere Reserve (including portions of Guadeloupe, Barbuda, and Sint Maarten),

and a Windward Island Biosphere Reserve (with parts of Martinique and Grenada) could be created as multi-site units under MAB. He uses existing or proposed protected natural areas such as parks as the keystones for his units. He also considers the possibility of an overall Lesser Antillean Biosphere Reserve, encompassing all three of the proposed units.

Gregg (1983) supports the concept of a Lesser Antillean Biosphere Reserve, and views the existing Virgin Islands National Park Biosphere Reserve as the first in a multi-unit system. He does not specify the other geographical units that would be included in a Lesser Antillean Biosphere Reserve, but believes that the "diverse terrestrial and marine ecosystems of the eastern Caribbean, in concert with the different cultural histories and land use traditions of the region, present exceptional opportunities for building multiple-site biosphere reserves to meet the needs of individual islands and the region as a whole."

These initial suggestions for establishing a Lesser Antillean Biosphere Reserve have led to many discussions on the adaptability of the concept to the diverse systems found in the eastern Caribbean. One paper (Chakalall and Geoghegan, 1983) analyzes the practicality of a Lesser Antillean Biosphere Reserve in the context of today's state of resource management and social and economic conditions in the Lesser Antilles. They are generally favorable to the idea and believe that although the ". . . concept needs much closer study before any attempt is made at implementation," a Lesser Antillean Biosphere Reserve ". . . could well provide the necessary framework" for working towards securing assistance on an international basis to ". . . further the integration of conservation and development in the region."

Farmlands and Biosphere Reserves

To understand what the role of farmlands can be in a Lesser Antillean Biosphere Reserve, we need to have some knowledge of the structure of Biosphere Reserves in general. An essential point to remember is that the MAB program ". . . is primarily a programme of research and training. It is not a programme of management . . . It is oriented to the solution of concrete practical problems of management and conservation of renewable natural resources" (Eidsvik, 1979). Therefore, the emphasis is not on regulations and directives; rather, the program seeks to develop educational programs and train personnel to properly manage the resources of their areas.

Biosphere reserves can be of two types. The most common is the single contiguous reserve, where all management zones are together. The other type is the cluster Biosphere Reserve, where units of the Reserve are not necessarily in close contact with one another. The proposed Lesser Antillean Biosphere Reserve would be such a unit. Both types of reserves can have the four basic management zones that occur in Biosphere Reserves:

1. **Core Zone** - This is the area with the least amount of human interference. There is no intended manipulation of the resources; preservation is the keyword. It is in this zone that baseline data for each region are established and much research is accomplished.
2. **Buffer Zone** - This zone contains essentially the same resources as the core zone. However, controlled manipulative activities are allowed; these are primarily consumptive uses of renewable natural resources such as timber harvesting and livestock grazing.
3. **Restoration Zone** - There can be areas within Biosphere Reserves that have had significant resource degradation (*e.g.*, soil depletion and loss of important vegetation). This zone could be the focus of research aimed at reclaiming the resources so affected.
4. **Cultural Zone** - This is the area where compatible land use practices are continued (*e.g.*, farming and commercial fishing). Ideally, no new (non-comparible) activities may be introduced, and the emphasis is on those human activities that have traditionally occurred in the area.

Some of the nations in the eastern Caribbean have established protected areas similar to the requirements of the core zone. These are usually designated as parks, sanctuaries, nature reserves, or whatever. Although many of these areas are primarily preservation-oriented (core zone) areas as defined by the MAB program, others have incorporated elements of the buffer zone and/or the cultural zone.

Putney (1983) has identified existing protected areas in the Lesser Antilles which can constitute core zone areas in a Lesser Antillean Biosphere Reserve. As the idea of the Reserve progresses, resources managers in each affected country should identify possible areas that could be incorporated in a cultural zone. Traditional farming areas are almost ideally suited for this, and the benefits to the farmer are many:

1. The farmer will have assurance that no non-traditional activities can be imposed in the cultural zone.
2. The farmer will have the benefit of research-generated information sponsored by the Man and the Biosphere program.
3. There will be controls on surrounding lands that will prevent watershed deforestation and other activities deleterious to farms.
4. Visual, aesthetic, and other natural conditions will be maintained as part of a continuing way of life.

Experience has taught many of us to be suspicious of governmental regulations over what we can and cannot do with our lands. To some, the Biosphere Reserve concept may seem to be just another layer of bureaucratic control. But, this is not the intent of the Man and the Biosphere Program.

One key element of MAB is that each participating country is responsible for proposing sites for Biosphere Reserves. The creation of a MAB area in no way affects the country's sovereignty. MAB is in close association with many other organizations in the United Nations system, including the Food and Agriculture Organization (FAO).

Another key element is funding. In most instances, countries that now operate protected areas which qualify under MAB guidelines can continue this level of support. In addition, however, they will have (potentially) access to UNESCO resources.

Another key element is support services. "A most important characteristic of biosphere reserves is that they form an international network in which the international character is ensured by the exchange of information and personnel. The MAB Secretariat at UNESCO provides coordinating services for the network and furnishes catalytic support" (von Droste, 1983).

Another key element is protection. Quite often, existing legislation covering protected areas constitutes sufficient resource protection. It is almost always preferable not to enact legislation specifically for Biosphere Reserves, although, of course, a country may do so if it so wishes (Eidsvik, 1979). Neither UNESCO nor any other entity associated with MAB seeks to impose a regulatory structure upon any nation.

CONCLUSION

An international system is now in place that can provide significant support and protection for farmlands in the Lesser Antilles and elsewhere. Not only can a Biosphere Reserve provide protection against external and internal environmental threats, but, as a part of the international Man and the Biosphere program, it can promote research and a flow of information useful to the farmer. A proposed Lesser Antillean Biosphere Reserve can be instrumental in providing a secure role in the land use planning process for small farm systems in the eastern Caribbean.

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