**PROFILE**

Evaluation Model for Developing, Implementing, and Assessing Conservation Education Programs: Examples from Belize and Costa Rica

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ABSTRACT / Evaluation of conservation education programs can: (1) provide accountability in demonstrating a program's worth, (2) offer an opportunity for receiving feedback and improving programs, (3) further our understanding of the process of program development, and (4) promote conservation education by substantiating claims about its benefits. The Planning-Process-Product systems evaluation model provides feedback needed for making decisions about the development, implementation, and outcome of a program. Planning evaluation was useful in assessing the needs, goals, opportunities, and constraints of a number of programs in Costa Rica and Belize, such as a forestry education project and a zoo outreach program. It provided a basis for making planning decisions incorporating specific objectives, such as the reforestation of a region or a change in knowledge and attitudes in program participants. Process evaluation provided a Costa Rican sustainable development program with feedback during its implementation and enabled it to modify and improve its newsletter for local farmers and its ecology classes for school children. Product evaluation assessed project accomplishments, such as the $700,000 raised by the Children's Rainforest group and the 20 miles of riparian land under conservation management as part of the Belize Community Baboon Sanctuary project. Outcomes are compared with the programs original monetary or land management objectives to determine the success of the programs and to provide feedback for improvement.

Conservation education programs can increase ecological awareness, foster more favorable attitudes toward the environment, and promote natural resource conservation (e.g., Dietz 1986, Fitter 1986, Jacobson 1987, Olson and others 1984, Sharpe 1982). Researchers concerned with biological conservation increasingly call for the further development of conservation-oriented educational infrastructure, particularly in developing countries (Brown 1988, Janzen 1987, Ramos 1988, Soule 1986). Yet, prescriptive guidelines are needed, such as those provided by evaluation models, to guide conservation education programs from conception through completion.

The limited funds available for conservation education demand the effective use of evaluation to ensure successful programs. Evaluation consists of the collection, measurement, analysis, and interpretation of data relevant to a program's audience and environment. These data are needed to make decisions about the merits of a program and to facilitate the assessment of whether a program meets identified needs or achieves specific goals and objectives: Is the program effective? Can the program be improved? Are the approaches and materials efficient and cost effective?

Evaluation provides accountability in demonstrating a program's worth—to funding sources, the community, and other groups. It offers an opportunity for receiving feedback and improving programs. Furthermore, evaluation helps in assessing secondary or unexpected program outcomes; it furthers understanding of the process of program development; and it promotes conservation education by substantiating claims about its benefits.

Unfortunately, evaluation seldom is carried out formally in conservation education programs in the United States or abroad, due to a perceived lack of time, money, or expertise (e.g., Wood and Wood 1985). Yet some form of useful evaluation can be included in program development even under the most difficult situations (Nowak 1984, Passineau 1975). Ideally, evaluation should be conducted from beginning to end, providing feedback on all stages of the development, implementation, and outcome of a program. A number of evaluation techniques have been developed over the past three decades. The approach of systems models (e.g., Stufflebeam and others 1971) provides prescriptive guidelines for program evaluation, including formative evaluation for planning and implementing programs, and summative evaluation.

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for assessing the products of programs. This approach, which I have modified into the Planning-Process-Product model, incorporates self-correcting processes to provide conservation education programs with the feedback needed to ensure their effectiveness.

Using the Planning-Process-Product model, three stages of evaluation are conducted. For each stage, needed information is identified and obtained. Figure 1 provides an overview of the model, the information to be examined at each stage, and the decision-making processes. These data are described in the discussion that follows using examples from: (1) the conservation education programs of three organizations operating on a regional level in and around the Monteverde Cloud Forest Reserve in Costa Rica, and (2) the conservation education programming at a national level in Belize. The data presented are only a small part of the information used in the systematic evaluation of individual programs or the cumulative evaluation of regional or national programming, but they serve to illustrate the model and to provide a sample of the innovative approaches to conservation education being introduced in Costa Rica and Belize. The Planning-Process-Product format has been useful for internal evaluation by staff involved in program development (Jacobson 1987, 1988a) and as a guide for program assessment by external evaluators (Jacobson 1988b). This article demonstrates how systematic evaluation can be used to guide and strengthen the development, implementation, and outcome of conservation education programs.

Planning Evaluation

During the planning process, the needs, goals, opportunities, and constraints of the program environment are evaluated. This provides a basis for defining objectives and choosing among alternative project designs. Community involvement is critical at this stage.

Defining Needs and Audiences on a Regional Level in Costa Rica

A number of conservation programs are associated with the Monteverde Cloud Forest Reserve in Puntarenas Province, Costa Rica. The reserve encompasses an area of 10,569 ha and was established in 1972 to protect the watershed for the Monteverde community and its unique wildlife. The reserve provides a sanctuary for over a hundred species of mammals and 400 species of birds, as well as the great diversity of plant life that grows in the neotropical cloud forest. In 1988, over 15,000 people visited the reserve and comprised just one of the variety of audiences currently exposed to a range of conservation information and education programs. The reserve is surrounded by small, rural communities practicing dairy farming and small-scale agriculture. Three organizations have developed conservation education programs associated with the Monteverde Cloud Forest Reserve and surrounding community: the Tropical Science Center, which administers the reserve, the Monteverde Conservation League (MCL), which purchases conservation land and provides reforestation and education programs, and the Monteverde Institute, which provides courses, mainly for US college students, in tropical biology and forestry, and cultural programs for the community. The basis needs or problems that the organizations are addressing in the region have been defined by the staff to include deforestation, dwindling water resources, unsustainable agricultural practices, lack of protection for biological diversity, lack of knowledge

Figure 1. Diagram of the Planning-Process-Product evaluation model.