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Ecological Development through Service-Learning

Daniel Baker

Abstract

This article describes a successful model used in international service-learning projects that integrates economic development and ecological improvement. The principles of the model are discussed, including commitments to maintain partnerships over time, emphasize the transfer of knowledge from one generation of students to the next, start small, build a history of success, and gain community trust. The application of this model to an evolving series of service-learning projects in Honduras is discussed. The article concludes with a discussion of some of the challenges and management strategies useful in implementing the model.

Introduction

The University of Vermont (UVM) has a long history of commitment to service-learning. In recent years the service-learning model has been institutionalized through the Community-University Partnerships program. At the same time, faculty-led international programs at UVM have experienced substantial growth, with the number of students enrolled more than doubling since 2000 *(Damon 2005)*. UVM has also committed to the expansion of service-learning throughout the university *(UVM View 2005)*.

The Department of Community Development and Applied Economics (CDAE) has been a leader in providing international field courses at UVM for more than ten years. A university-wide emphasis on service-learning, heightened by student interest in international fieldwork and a desire within CDAE to increase the community development benefits of field programs, led to the design of a new model for community outreach based on service-learning and ecological economics. This model is currently successfully employed in academic courses offered in four countries in the Caribbean and Central America.

This article describes CDAE's experience in the implementation of the ecological development service-learning model. The article begins with a brief history of service-learning at UVM and

then outlines the CDAE Ecological Development Service-Learning Model. An example of this model's application in Honduras is used to illustrate its progress over time. The article concludes by discussing the challenges that should be considered in ecological development service-learning models and providing some strategies for addressing these issues.

Service-Learning at the University of Vermont

UVM was an early advocate of service-learning, founding the Center for Service-Learning in 1972. After a decline in interest, the service-learning program was reinvigorated when UVM received a federal Housing and Urban Development (HUD) Community Outreach Partnership Center (COPC) grant in 1998. This grant led to the creation of the Community-University Partnerships and Service-Learning (CUPS) program, which is specifically charged with supporting service-learning at UVM. The COPC grant also coincided with a new university president, Dan Fogel, who has been a vocal advocate for increased incorporation of service-learning throughout the disciplines at UVM. These changes have led to a dramatic increase in service-learning at UVM and to its institutionalization across the campus.

UVM has adopted the following definition to guide its programs: Service-learning is "a form of experiential education in which students engage in activities that address human and community needs together with structured opportunities intentionally designed to promote student learning and development. Reflection and reciprocity are key concepts of service-learning" *(Jacoby 1996, 5)*.

In addition to the CUPS program, whose staff facilitates and maintains partnerships between faculty and community groups, faculty training programs have been developed ranging from workshops to an annual service-learning fellows program for faculty. Faculty whose courses are designated as service-learning can apply for service-learning student teaching assistants, who enroll in a credit-bearing course that supports their service-learning course activities. As an additional incentive, service-learning teaching assistants have a number of options for compensation, including registering for an AmeriCorps Education Award, receiving payment through work-study, or opting to receive academic credit. All CDAE International Program courses have received the service-learning designation, and most utilize the service-learning teaching assistant program.

The Ecological Development Service-Learning Model

Community outreach through service-learning domestically and internationally has been a central component of the CDAE Department at UVM since its inception. CDAE has been a leader within UVM in the development of Faculty-Led Programs Abroad (FLPA), offering such programs for more than ten years, initially in Belize and Trinidad. These programs were founded on a project-based learning approach that matched faculty and students with community projects in developing countries. This project-based approach has remained a central element as CDAE has expanded its international programs to Honduras and then to Dominica, St. Lucia, and the Dominican Republic.

As the concept of service-learning developed, the CDAE international program sought to ensure that service-learning experiences benefit both the provider and the recipient of the service *(Furco 1996)*. This led to reflection among faculty about the nature and degree of benefit that field courses offered to community partners. In particular, faculty questioned whether their international programs were accomplishing sustained and meaningful development that addressed the multifaceted aspects of improving quality of life, particularly for low-income communities in developing countries.

Strategies to improve the benefits of service-learning to community partners include participatory action research and community-based research. Cruz and Giles *(2000)* found that most service-learning programs fail to consider how their program affects the communities they serve. They recommend a participatory action research methodology that assists communities in defining their own goals. An extension of this approach is community-based research (CBR), which seeks to develop research partnerships between academics and communities that address the interests of both *(Strand et al. 2003)*. Stringer *(1999)* describes community-based action research as an iterative process through which benefits to communities build over time. The theory and methods of CBR provided guidance in the development of the CDAE program. Increasing the community-based research component in service-learning is a goal of the ecological development model described here, and CBR has played an increasing role as projects have developed over time.

CDAE's roots in applied economics and the international program's project-based experiences in developing countries have led to the incorporation of concepts of ecological economics in both campus and field courses. Ecological economics may be

understood as the joining of ecology and economics, with the economy viewed as a subsystem of the global ecosystem *(Daly and Farley 2004)*. This represents a significant shift in thinking about development that requires much greater consideration of the interaction between ecological processes and the effort to change economic conditions.

Economic growth that comes at the expense of environmental quality is recognized as a global issue *(WCED 1987; Prugh, Costanza, and Daly 2000)*. Communities in less-developed countries are particularly dependent upon the flow of ecosystem services for their well-being. The functioning of natural systems is critical for the poor in developing countries *(WRI 2005; Mock and Steele 2006)*. Thus CDAE's project-based service-learning model expanded to address more explicitly the link between community development and maintaining environmental quality and ecosystem services. Ecological development seeks to reduce the environmental impact of development and enhance the delivery of ecosystem services to improve human welfare in both the short and long term.

Sustainable societies are not static, and development requires continual, purposeful learning at the community level *(Prugh, Costanza, and Daly 2000)*. Short-term technical transfers often fail to bring communities out of poverty, and therefore technical assistance must be provided and managed over the long term to build the capacity for local project management *(Krishna, Uphoff, and Esman 1997)*. This "assisted self-reliance" approach has been an important guide in the development of the CDAE model.

The ecological development service-learning model is based on a core set of principles for success from both academic and community perspectives:

Develop multiyear projects and partnerships. A central component of the ecological development service-learning model is that students learn through the implementation of development projects. This principle requires discernable improvements to the quality of life of our community partners. Community development is rarely easy, and it takes time. Single-semester projects are unlikely to develop adequate understanding of the local context or sufficient levels of community trust to design, implement, and evaluate the community impact of service-learning projects.

Particularly when working in disadvantaged areas, it is necessary to consider whether a sufficient commitment can be made to build a relationship with communities, design and perhaps redesign projects based on community input, and then see projects through to their conclusion. Often this process requires development of multiyear partnerships with communities.

Establish and maintain bridges. Particularly in an academic environment based on semester-long commitments, it is critical to plan for and build bridges that span semesters and often projects. In the university setting, the greatest stability for multiyear projects can be developed through faculty who commit to maintaining relationships with the communities in which they initiate projects. Although more limited in their overall time commitment, students who return for two or more semesters enable the development of student-to-student bridges that transfer knowledge and experience between classes. Similarly, fostering partnerships that will persist over time facilitates development of trust and thus of progressively more advanced projects.

Provide service-learning projects for different levels of student skill and commitment. Variation in the level of student capability and commitment presents a challenge in service-learning. Selecting projects according to the general characteristics of student participants can provide a service-learning experience to a wide range of students and meet community expectations. There are a variety of ways to accomplish this. One strategy is to cultivate the more technically advanced and motivated students and encourage them to return in following semesters as team leaders. Projects should be designed so that less advanced or motivated students can have a meaningful experience, with technical requirements and expectations that match their skill and commitment levels. Developing programs that accommodate different levels of skill and motivation can provide students with options for more or less intense experiences. In international programs, explicitly considering levels of national development can aid in choosing project areas that provide levels of difficulty appropriate to students and faculty. Use of the Human Development Index (HDI) to classify countries based on their level of development is described later in this article.

Start small. Accomplish your objectives. Build on success. A key element of successful projects is to accomplish what is promised. Meeting objectives is critical for building community trust. Particularly when working with new community partners, establishing a record of success provides the basis for developing more ambitious projects later on. Programs develop credibility over time by continuing to work with communities with whom there is a shared history of work, reciprocity, learning, and success. Maintaining trust, respecting partners, meeting commitments, and developing and maintaining an excellent institutional reputation are essential.

Embed service-learning projects in their larger context. Students involved in service-learning projects should undertake coursework that provides both practical and theoretical background, which places their work in a larger context. Service-learning courses require greater levels of commitment and responsibility. Such coursework involves students in project design and provides them with an understanding of the underlying problem being addressed, why it is important, and how such problems have been approached in other instances. This type of content encourages student engagement.

Prepare students for safe, effective community fieldwork. Fieldwork is a very different activity from the classroom experience. Language and dress have relatively little bearing on student success in most classrooms but can have a significant and long-lasting impact when working with community groups. Particularly when working with low-income communities in developing countries, health and safety are basic and critical to a successful service-learning experience.

Operation of the CDAE Service-Learning International Program

The CDAE International Program courses are two weeks in length, preceded by or embedded within a semester-long preparatory course. These preparatory classes emphasize the host country's history, basics of project planning, and fundamental practices for maintaining health and safety while conducting fieldwork in developing countries. Rules governing behavior are discussed and agreed to by all participants before they are eligible for the field experience.

The dissonance between students' lives and those of their community partners is an important element in international service-learning programs *(Kiely 2005)*. However, not all students desire, or are prepared for, the realities of fieldwork in the poorest developing regions. The CDAE program has been designed to provide students with a range of options for working internationally. While all field courses operate in developing countries, countries are selected to represent a significant range of economic development levels.

Levels of community development at the national scale can be assessed using an index such as the United Nations Human Development Index (HDI), which evaluates 177 countries based on life expectancy, literacy, and income *(UNDP 2005)*. Countries assigned higher numbers are less developed. For example, St. Lucia ranks 76 on the 2005 HDI. The St. Lucia service-learning program offers students amenities that they might expect in the United States. The Honduras program involves a much more challenging environment with markedly fewer amenities: community partners are clearly economically disadvantaged, environmental degradation is apparent, and basic needs such as clean water and sanitation are often lacking. Honduras's HDI rank of 116 indicates the greater differential of development that students will experience when leaving the United States, which has an HDI ranking of 10.

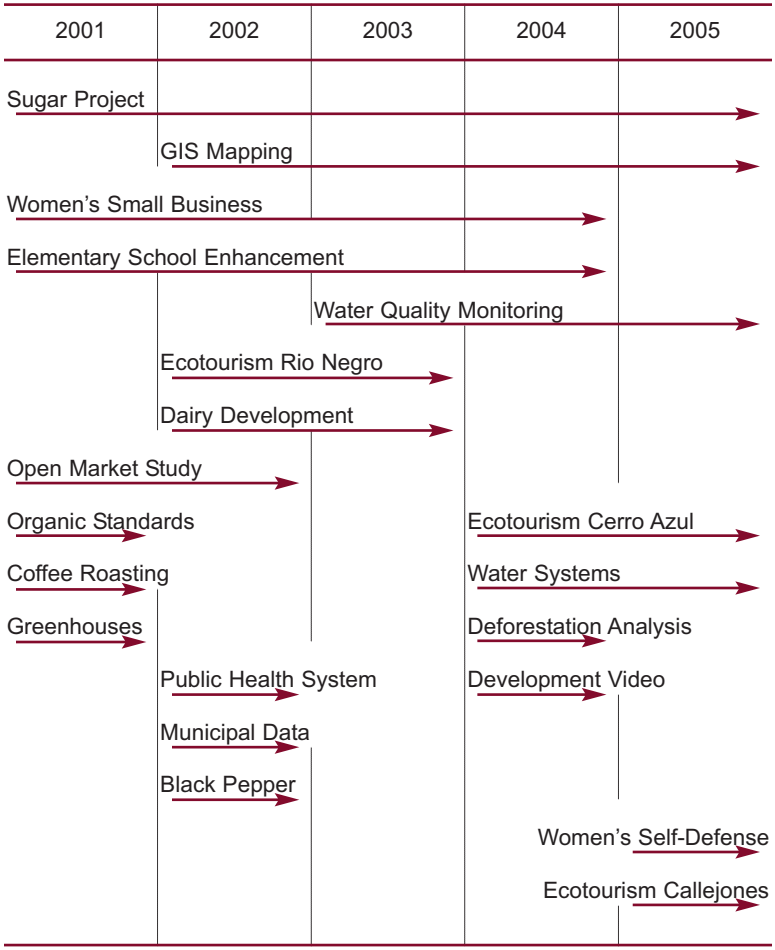
The CDAE program is funded primarily through student tuition and student program fees. However, additional funding sources have played a significant role in the development of the program. UVM offers an annual competitive grant to undergraduate students for independent research under the guidance of a faculty member. Students in all four international programs have received these grants. The university also provides International Incentive Grants to faculty to develop or expand international partnerships. Finally, faculty and students have obtained outside funding through private and public institutions to support community development projects involving students and faculty.

Application of the Ecological Development Service-Learning Model in Honduras

The CDAE program in Honduras has been in operation for more than five years. During this time, the program has undertaken a variety of service-learning projects, including

multiyear projects with progressively more advanced levels of faculty and student involvement. As figure 1 indicates, some projects have continued over multiple years, while others have been of shorter duration. In some cases a project's shorter length reflects the accomplishment of short-term goals. In other cases, local changes, such as the dissolution of a local women's microfinance bank, brought the project to a close. A number of shorter projects contributed to longer-term projects. For example, research into international organic standards during the first year of the program was a discrete service-learning assignment that supported the Ecological Sugar Project described in the following section.

Evolution of CDAE Honduras Projects



The Ecological Sugar Project

The Honduras program has its roots in one substantial ongoing project in the Lake Yojoa region of the country. This project illustrates the integration of economic development and the protection of ecosystems through a multiyear service-learning program that led to expansion into new and quite different service-learning projects.

In 1999, I began to work with a local small-scale sugar farmers' cooperative that was facing economic and environmental challenges resulting from its production practices. To produce their blocks of sugar for the local market, farmers initially used wood to fuel their evaporators. As the region was deforested, producers switched to burning used rubber tires, a locally available and inexpensive fuel source. By 1999, in the area surrounding the municipality of Taulabe, over a hundred small and low-income farmers were burning rubber tires for evaporator fuel, leading to respiratory illness for these producers, the surrounding community, and children in particular. The interconnectedness of economic development, ecological degradation, and negative impacts on human health made an integrated, ecological approach to this problem essential.

To assist these farmers, I worked with a local sugarcane producer's cooperative to transfer and adapt an evaporator used in maple sugar production in the United States. This project, which came to be known as the Ecological Sugar Project, subsequently received funding from the Honduras Secretary of Agriculture, the Inter-American Development Bank, Partners of the Americas Farmer to Farmer program, and a number of private foundations.

UVM students have assisted in the Ecological Sugar Project since early in its development. Student teams have worked directly with the sugarcane farmers in assessing the efficiency of the evaporator, creating new value-added products, and developing marketing strategies. Other students have assisted the sugar cooperative with business management and planning. As of this writing, more than five hundred producers in five different departments in Honduras are using the evaporator, and training programs are being planned for 2006.

The positive experience in the sugar project, combined with repeated visits to the same Honduran communities, provided UVM with substantial credibility in the communities with whom we worked and created opportunities for further involvement in local community development projects. These projects included

support and training for a local women's microfinance bank, educational programs in the elementary schools, and ecotourism projects. The partnerships developed in completed projects may serve as a foundation for future, often related, endeavors. For example, students participated in a two-year market study that assisted both the sugar cooperative and the women's bank in identifying marketing opportunities. The following section details how one particular project path evolved.

Water Quality Monitoring and Water Filtration

Working with the municipal government and local community groups in the Lake Yojoa region, students identified a need for better environmental health data during the second year the service-learning course was offered in Honduras. A highly motivated returning student obtained a university grant to conduct a rapid environmental health assessment. This ambitious project, supported with the assistance of a graduate student using GIS technology, identified two sources of concern: a general lack of environmental data and the likelihood of widespread water contamination.

Over the course of three years, a lay water quality monitoring program was adapted and transferred to the community. A local high school teacher, who was also president of the local Red Cross chapter, was the lead partner. With his assistance, an environmental club formed at the high school and received training from UVM students in water quality monitoring. During the initial year, a returning UVM student received a university grant, as well as outside funding, to purchase for the school environmental club a basic presence/absence of E. coli bacteria water testing kit. The Honduran students, assisted by UVM students, tested public drinking water systems in the area and found contamination in all systems. After the UVM students left, the high school program continued to collect data. The high school teacher incorporated the data into his classroom programs and requested that UVM find a more specific test that could quantify the level of contamination.

The following year CDAE students located a low-cost monitoring test that could distinguish the number and type of *E. coli* colonies present in drinking water. After being trained in its use by the previous student team leader, CDAE students brought the system to Honduras and trained the high school students. This more descriptive test confirmed the previous year's findings of

widespread contamination, and the ability to quantify the levels of contamination indicated the severity of the problem. For example, seven community drinking water system tanks were studied, and all tested positive for *E. coli*. After the formal class ended that year, a number of undergraduate and graduate students remained in Honduras to work with CDAE faculty and Honduran community partners on a community forum to share the water quality data with water system committees throughout the municipality. This forum was used to guide subsequent projects and expanded the number of community members involved in project development. A key outcome of the forum was that the community wanted to address the water contamination problem and asked for UVM's assistance in this effort.

During the following year, faculty from CDAE met with faculty in the Department of Civil and Environmental Engineering at UVM to involve engineering students in the Honduras water quality project. Engineering students studied socioeconomic and environmental data as well as water quality data to evaluate alternatives that would improve water quality. Engineering students came to Honduras over the course of two years to develop a design for a sand filter for 180 families in the villages of Jaitique and Las Flores, Taulabe. Funding for materials was provided by a nonprofit foundation that had previously contributed to the sugar project. The local community is providing ten percent of the cash cost and all the labor needed to install the system. Once it is fully operational, the local high school environmental club will begin testing the change in water quality and training the local water committee to undertake the testing.

These experiences, as well as the work with the Ecological Sugar Project, demonstrate the principles of ecological development through service-learning. Students gained valuable experience that required substantial application of academic training, and a number of students have been rewarded with academic honors and research grants. Community partners have expressed their development needs and, through research partnerships with university faculty and students, have been able to implement appropriate technologies that address economic, environmental, and human health concerns. Institutional interdisciplinary research and relationships have been fostered. These partnerships within UVM and between UVM and community partners continue to grow in depth and breadth.

Challenges to the Integration of Ecological Development and Service-Learning

Though the experience in Honduras has been very positive overall, undertaking and maintaining such a program still presents substantial challenges. Institutions that seek to expand international service-learning options should plan to address a number of elements unique to this educational approach.

Particularly critical is recognizing the increased time commitment that service-learning requires of faculty. This widely underappreciated aspect arises from the additional requirements of successful service-learning projects. Some elements of the service-learning model mirror traditional teaching activities; for example, reflection papers replace research papers. However, other elements are unique additions to faculty workloads. These include project development and management, coordination and communication with community partners, and follow-up activities that may continue beyond the end of the semester. Less tangible, though no less important, are faculty commitments to provide a service to community partners: if students fail to produce a satisfactory product, there may be an expectation, from the partner or from a personal ethic, for the faculty member to bring the project up to an acceptable level. However admirable the motive, this type of commitment can increase both time commitment and stress level for faculty. At UVM the CUPS program has sought to address these issues by providing services to faculty, including assistance in the design of service-learning courses and the teaching assistants program.

The aura that surrounds universities, particularly when working with low-income communities, can present difficult situations for faculty and program coordinators. Community partners often expect more than university students can accomplish. It is important to discuss these expectations early, clearly, and realistically with partners. In the glow of a positive welcome from a community council, it is easy to want to maintain the level of excitement, and more may be promised than can be delivered. However, the benefits of encouraging a positive but realistic environment, and particularly the specification of attainable objectives, cannot be understated. In the end, all involved—faculty, students, community partners, and the program itself—will be better off for developing a history of

small successes rather than attempting too much and failing at that.

Working in less-developed countries presents unique and challenging issues whose importance is heightened when a service-learning aspect is included. Communication can present formidable barriers during pre-trip planning. Phone calls between countries are expensive, and community partners in low-income or rural communities may have to travel significant distances to access telephone or Internet sites. A trustworthy liaison in the developing country can often facilitate communications. Once in the country, the differences in language and culture can also present barriers that make project implementation more difficult. Health and safety issues must be considered at all times, which adds to logistical complications. The CDAE program manages these challenges in a number of ways. The semester-long preparatory course uses presentations and discussions to explicitly address these issues. Having clear safety rules that students understand and agree to is essential. The experiences of students who have previously been to the country and worked on projects is a tremendous asset in communicating to new students the importance of preparing for the immersion in a different culture.

Conclusion

The application of the ecological development service-learning model has been highly successful and rewarding for faculty and students. Students have responded positively to the courses, and many have participated in the program more than once and with increasing levels of academic rigor and responsibility. A number of students have been recognized through university honors and awards for their international work. The program has expanded from offering courses in one country each year to four countries over the course of five years, with student waiting lists for enrollment. Faculty and students have been successful at obtaining funding to support projects, both from within and outside the university. Community partners have been demonstrably satisfied with projects, inviting the program to return and undertake new projects. The CDAE experience with the ecological development service-learning model suggests that the model is both challenging and accessible. Enduring partnerships have been formed based around ecologically sound

pathways to prosperity that benefit both community partners and university students and faculty.

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About the Author

• Daniel Baker is a lecturer in the University of Vermont Department of Community Development and Applied Economics. He has worked internationally in Guyana, Belize, and Honduras and has led the CDAE Honduras program for the past five years. His current research interests involve the impact of a new evaporator design on small sugarcane farmers' overall quality of life in Central America and the use of fuel-efficient stoves and biodigesters in Ethiopia.