Non- Formal Environmental Education in the Republic of Panama

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Study Abroad Participant, Republic of Panama, Spring 2002

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Introduction

Education programs have been identified time and time again as the most promising solution to increasing environmental awareness. By building a stronger relationship between the community and the environment, conservationists hope to bring about cultural changes while building a community pro-active in conserving resources, preserving biodiversity, and keeping the environment clean. One form of education that exists world wide, and is just beginning to grow here in Panama, are programs designed specifically for children that target environmental issues and solutions is titled Environmental Education (**Educación Ambiental = EA**). Ea exists in several forms- formal, non formal, and informal programs. By targeting a young age group, educating students about the importance of resources and building environmental awareness is a much easier task because, unlike adults, children have not been completely socialized into their community and are still in the process of forming their opinions and ideologies.

Not much is known about the circuit of education programs in third world countries who have a more limited access to resources while, at the same time, are presented with pressing environmental issues. The original focus of this paper was to determine efficiency and the breadth of EA here in Panama by doing four case studies. The intent was to observe if education, focused primarily on the younger generations, resembled more closely a capable, well-organized network of support, or a sparsely seeded field. The

environmental programs encountered here ("encountered" because they are difficult to track, identify and isolate) are not only abundant, but cover a wide variety of topics, all with varying methodologies, target subjects, and program goals. However, most programs are all at the very beginning stages of development, and efficiency, as of yet, can not be determined. Instead, I chose to compare and contrast four different case studies to highlight their strengths, weaknesses, and to try and track the rough outline to determine the path EA will be taking here in Panama from this point on.

Global History of EA

Many countries of the world have recognized the need for Environmental education as a way to protect and better their environment. In both 1974 and 1977, the United Nations coordinated a series of meetings to establish a Global standard for EA. In 1977, the delegates of the Intergovernmental Conference of the UN in Tbilisi, Georgia settled on the following definition of EA: "Environmental education is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (Haley, TEEM)."Environmental education enhances critical thinking, problem-solving, and effective decision-making skills, and teaches individuals to weigh various sides of an environmental issue to make informed and responsible decisions (McKay, 1994).

There are three general forms of EA that are recognized worldwide- *formal, non formal, and informal EA.* Formal EA programs are agreed upon by collaborating organizations as to official plans of study for each grade level that are implemented within the school. These programs demand mandatory participation and completion by the students in order to continue to the following grade level. Informal EA, the most indirect form, because it is unintentional, is the education that takes place through multiple channels of communication without any direct interaction with teachers or lecturers. It is the process of transferring knowledge through visiting natural parks, other contact areas with nature, attending environmental fairs, and general observation of the surroundings. This study, however, focuses exclusively on the third type of EA- Non Formal EA is executed through outside institutions and organizations who have designed official study plans as a way to specialize knowledge for a specific interest in particular themes. Even though the programs may take place within the classroom, students are not required to participate and programs are not available as part of the regular class curriculum (Quintero de Cárdenas, 2002).

Outline of Panama's Recent EA History

(Quintero de Cárdenas, 2002)

-1973. *La Dirección National de Recursos Naturales Renovables* (RENARE) was created with the philosophy of regulating the use of and protection of renewable natural resources.

-1972. The Political Constitution of Panama, later reformed in 1978 and 1983, called for an Ecological Regiment and conservation of natural resources and the environment.

-1986. *Instituto Nacional de Recursos Naturales Renovables* was created, focusing on the politics of conservation within environmental education, signing the first contract with the *Ministry of Education*

-1990. The office of EA within the Ministry of Education was created with the ambitions to plan programs of environ. Education with respect to the environment

-1992. With Law N° 10, EA was adopted as a national strategy to conserve and develop natural resources and preserve the environment.

-1994. STRI's Exhibition Marine Center in Punta Culebra opens to local school groups

-1998. ANAM recognized EA as one of the most important instrument in environmental management

-2001. Panama is initiated in to Program GLOBE's network

-September 2001. ReAL- Boquete begins meeting to develop their recycling project

Panama's Accomplishments and Goals for EA

The recent development of Panama's environmental policy and environmental education can be explained in that in the early 1900's, international organizations and governmental aid was providing the framework necessary to temporarily meet the needs of the time (McKay,1994). Recently, however, Panama has been taking an active effort in

preserving their natural resources through Park Conservation and EA. In 1992, was adopted as a national strategy to conserve and develop natural resources and preserve the environment, however it is still in the early stages of development, as we speak (Parques Nacionales, 2002). However, since 1992, EA has expanded in all provinces of the country brining with it the creation of many new and expanding national organizations- such as governmental institutions, non governmental organizations, local groups, volunteers- and it has also attracted the support and aid of many international entities as well (Quintero de Cárdenas, 2002).

In Panama's plan for EA development, as presented by ANAM- an autonomous organization that recognized EA as one of the most important instruments in environmental management- the aim is to utilize EA to "modify the concepts and perceptions of the population as they relate with their natural resources and their environment and the participation of the citizen through 2 specific objectives.

1. Implementing both formal and non-formal EA programs as a tool to integrate values, develop habits, and manners that work to promote environmental protection and the conservation of natural resources.
2. To generate plans of actions and strategies that include citizens of the populations in the formulation and execution of policies, strategies, and environmental programs on the national and local level (Quintero de Cárdenas, 2002)."

Today, the direction, development, and facilitation of non-formal EA in Panama is structured as an interdependent web of vital contributors. This network includes a selection of institutions-the Ministry of Education, ANAM, governmental organizations, and non-governmental organizations- on a national level with other international contributors,

technical specialists- social investigators and scientific researchers- and promoters of change- social workers, communicators, and teachers. Through the process of inter-institutional collaboration, EA programs are allowed to function with a dynamic and flexible planning process through recognizing social and environmental needs (Aviles, 2002). The Ministry of Education, in a collaborative effort with other organizations, has realized three major national accomplishments in the recent history of EA

1. Achieved the implementation of formal and non formal education programs in the form of materials, teachers, civil groups, rural communities, and institutions.
2. EA has worked to improve general conscientiousness of environmental themes and brought awareness to the necessity of conserving natural resources- water, air, soil, plants, and animals.
3. Written and implemented the use of 8 *Guías Didácticas de Education Ambiental* (Guides/workbooks) in 118 primary schools across the country as of 2002 (Quintero de Cárdenas, 2002).

Further projections of EA include:

1. to continue the use of Ministry of Education guide books within primary schools
2. to introduce levels of EA in the university level
3. to elaborate the ME guides for other levels of education
4. to elaborate the national strategy of formal, non formal, and informal EA (Quintero de Cárdenas)

There are more specific plans for further development of EA here in Panama; however, these plans have been constructed interdependently within each contributing organizations. As most plans are still in early stages of development, it is not only difficult

to locate these plans but it is hard to recognize the programs in actualization and the programs that have yet to be realized.

Case Studies

To asses the environmental programs here in Panama, I focused on four very different programs that specialize on youth education and non formal programs within the school system:

1) **GLOBE- G**lobal **L**earning and **O**bservation to **B**enefit the **E**nvironment, supervised by the Ministry of Education, ANAM, ANCON, and the Peace Core, and international contributors
2) **CIA- Circulos Ambientales Infantiles**, supervised by ANCON
3) **Punta Culebra Marine Exibition Center**, supervised by Smithsonian Tropical Research Center
4) **ReAL- Boquete,** supervised by a group of local volunteers

These programs differ from each other in not only their education techniques, but also in their history, funding, challenges, affiliated organizations and goals. All of these differences combined come together to create a wide array of education programs that are vital in addressing the many issues of conservation. Analyzing and comparing each program can suggest the general focus, trend and success of EA in Panama. What can also to be identified are the existing challenges, difficulties, and obstacles that EA programs in Panama must overcome, and suggestions for improvement and expansion can thus be made.

The List of Characters:

One thing that is important to note before each program is described is that many of the supervising organizations for each program are easily identified but supporting organizations are not. This is because the leading players in the education combine to play an integrated roll in each of these programs and so will not be limited to one specific program but several: for example, a programs administration, support, or organization. Some of the Key players that are important to become familiar with are: Ministry of Education- the governmental organization that is in charge of the regulation of all education policy, ANAM- an autonomous entity of the state whose purpose is to assist in the application and formation of laws, regulations, and national policy of the environment (Quintero de Cárdenas, 2002), the Peace Corp- an international aid program composed of US volunteers, STRI- a US based research organization, and ANCON- a non profit, non governmental organization focused on promoting conservation and sustainable resource use(Aviles, 2002) . Each of these organizations play a specific role in the web of EA, providing individualized goals, various themes and topics, a wide spectrum of methodologies, and an expansive network of support.

1. GLOBE: **G**lobal **L**earning and **O**bservation to **B**enefit the **E**nvironment is an international organization skilled in both scientific research and education. The program unties students, teachers, and the scientific community in an effort to better understand the global environment and climate changes through the collection and analysis of data on the part of the students. The program objectives, as stated by Panama's ministry of Education are to:

1. to better the environmental conscientiousness of the people of the world,

2. to contribute to the scientific comprehension of the earth,
3. to help students achieve a better level of understanding in science and mathematics (Direccion de Educacion Ambiental, 2002).

On an international level, GLOBE is striving to collect data pertaining to the atmosphere, water quality, soil, and forest cover from each of its contributing program sites in over 97 countries. So far, in the program history over 10,000 schools worldwide have been integrated into GLOBE's network (America Tuñon- periodista, 2002). The data, as it collected from study sites, is organized on a large international database over the web and utilized by scientists and educators all over the world. Since Panama was initiated into GLOBE's network in 2001, already 24 schools spread across the Provinces of Panama are contributing to the collection of national data. However, because the program was so recently introduced to the school system, Panama's research topics have been limited to the collection of atmospheric information- recording such information as precipitation, temperature, and aerosol levels. On a national level, the Ministry of Education together with a committee formed by ANAM, the Peace Corps, and ANCON is supervising GLOBEs instruction within the education system (Direccion de EA, 2002).

Within each participating school in Panama, just as in the other GLOBE countries, the students are assigned a study site from where they are to collect their data. A volunteer is responsible for assisting the students in retrieving and recording information, and teaching the school groups how to analyze the collected material (Direccion de EA, 2002). All schools have an internet system with which to connect with an international processing center. The material obtained is sent over the web to GLOBE's network and serves two general purposes:

1. So that the scientific staff can utilize the program and achieve a better understanding of the global environment.
2. So that the students are taught how to utilize the measurements together with other schools in the program and are not left alone in conducting such a rigorous research program (America Tuñon- periodista, 2002) .

One of the most important benefits of the program is that members of the scientific community reinforce the activities of the teachers and students. The program is designed so that it not only reaches the students and instructors, but so that it also includes members of the community, civil clubs, organizations, and business. Assistance from the community is needed to help acquire and use the research equipment, transport the students to the various study sites and to collect data during school vacations (America Tuñon- periodista, 2002).

As for the future plans for GLOBE, ANCON has called for an in-depth study of environmental programs here in Panama. The study is recommended to include a breakdown of what programs have been implemented up to date, where the programs are located in the country, in what direction they are heading, topics they include, and an over all analysis of their successes. The study is asked to also identify all contributing institutions, organizations, NGOs, environmental promoters and their level of involvement (Direccion de EA, 2002). Although this report (the ISP) only focuses on non-formal programs of environmental education, hopefully it will contribute in the pursuit to understand the entire web of programs here in panama. Also, the fact that such a suggestion was made, to analyze and bring better organization to the knowledge of existing

educational programs, shows the desire to increase the understanding, and begin better collaboration between organizations.

2. CAI-Circulos Ambientales Infantiles: ANCON-

Since 1985, ANCON has given priority to teaching citizens about various environmental topics and their relation to conservation. In 1993, with the creation of la *Direccion de Education Ambiental*, they began looking for effective strategies with which they could increase environmental awareness and incorporate the people of Panama into the acquisition and transference of knowledge. Through this goal, ANCON has developed valuable programs in communities located mainly in the protected areas of the Canal Watershed. Through the realization of such programs as PANAPARK (proyecto Manejo y Conservation de los Parques Nacionales Soberanía y Camino de Cruces), a system of Environmental Workbooks: *Cartillas*, and the implementation of student environmental organizations (CAI- *Circulos Ambientales Infantiles*), ANCON is attempting to create valuable experiences that assist in efforts toward sustainable development and conservation (Aviles, 2002).

ANCONs ideas of environmental education are more specifically defined as "the process of cultural change accomplished by forming pro-active citizens through a collaborative effort of key players that come from varying levels and sectors (Aviles, 2002)." Today the EA methodologies of ANCON are based on three principals:

1.That their ability to serve the community depends on their ability to listen to the communities needs, with an education system based on the exchange of information between the people and the organization.

2. That the participation of the people is a key factor in achieving goals.

3. That knowledge alone cannot guarantee the sustainable use of natural resources and that it is also important to provide knowledge that can be positively applied to influencing the actions of the people by helping them understand their impact on natural resources and environmental surroundings (Aviles, 2002).

One of ANCON's most notable non formal education programs is called CAI-*Circulos Ambientales Infantiles.* CAI is an environmental organization formed by students and facilitated by ANCON to promote family, and social values and community involvement (Aviles, 2002). Through these student groups, located in communities of high contamination risk, students are encouraged to interact with their environment, discuss environmental problems within the community, and plan actions to better the situation of the environment. CAI's mission statement is summarized in the ideal that "the awareness of the youth of the population about the problems of the environment is the best way to plan for the long run. The most successful program is one that unites kids with the problems and solutions (Circulos Ambientales Infantiles, 2002)."

The participants of CAI are motivated to bring about environmental and cultural changes through the execution of micro projects. Thus far, nine schools in nine communities, mainly located within the area of the Canal Watershed, are participating in CAIs program, reaching a total of 21 teachers and 330 students of primary school. Each participating classroom collaborates to contribute to one of five different micro projects: Conservation of biodiversity, Quality of river water, domestic systems and water purification, management of solid wastes, and organic ecological farms (Circulos Ambientales Infantiles, 2002). These micro projects serve as the core of the program, bringing about life style changes through a process of hands on learning experiences with the community and educators.

Each micro project within CAI utilizes different techniques to attack the immediate problems of facing their community. The study of the quality of water in the river Chilibre, for example, is attempting to understand the process of water quality through a process achieved by teaching the students how to recognize such contamination indicators as alkalinity, PH, nitrites, nitrates, and dissolved oxygen. The students have already contributed to call early attention to the raising level of water contamination in the rivers of the watershed. In the community of Alfajía, located in Lake Gatún, as another example, students designed domestic filtering devices using sand that could retain all suspended particles. A system of 55 gallon water tanks were put to use within the school system to guarantee that the students would have high quality water safe for human consumption (Circulos Ambientales Infantiles, 2002).

The activities of these micro projects all take place within the classroom environment. To begin the process, ANCON facilitators select the schools, and wait for a classroom to volunteer to participate. The three formal steps include: first, creating a connection with the school system, second, introducing methodologies into the classroom, and third, the actualization of the program. Once the program has been introduced to the children, general objectives are taught and the schools are visited once, roughly every 15 days to work with the kids on their specific projects (Interview, Aviles, May 7, 2002)

The CAI program is complimented in the classroom with four workbooks, or *Cartillas*, that include lessons, investigations, and take-home questionnaires within the four themes of: the environment, water, biodiversity, and the earth (Aviles, 2002). The books are structured so that the lessons can be utilized directly in classroom but also so that the concepts can be shared beyond the schools as the students are required to complete a certain lessons at home with the help of their families. Each student has his own book,

which contains lectures about the title theme with both environmental and sociological aspects (Interview, Aviles, May 7, 2002).

These programs, though not as formal as some of the other forms of education existent in the realm of EA, are an example of the kind of programs that are aimed to better the quality of life for the people of the community in which the program is based. The program goals do not exist with the sole purpose to support and achieve conservation but also focus on sustainable resource use, how to maximize product with little harm and environmental impact as possible, and how to keep the area clean. These programs have a much more direct impact on the people they work with, other than the students, in that the material is focused to apply on immediate problems within the community, designated and selected by the students.

3. STRI- Punta Culebra Marine Exhibition Center:

The Smithsonian Tropical Research Institute is a division of the Smithsonian Institute based in the United States. STRI is recognized worldwide as one of the leaders in scientific investigations in tropical ecology and diversity with the institutional mission to increase and diffuse knowledge (Programas de Visitantes, 2002). STRI has facilities located all over the world to give them a general view of the diversity of tropical ecosystems. However, within the country, Panama houses the largest facility network outside of the United states, with six research stations spread across the Provinces, and a large office/library system based in the center of Panama City (Lecture, Nelida Gomez, March 15, 2002).

STRI is a research based organization whose info structure here in Panama is large enough to include separate research facilities within the country that exist for the sole

purpose of education, public awareness, and ecotourism The education program located in the Marine Exhibition Center on Punta Culebra on the Pacific side (the program highlighted in this study) is just one of the three larger instillations that form an important circuit of education and tourism along the Canal. The other two programs are located farther from the City of Panama, one in Barro Colorado within the Canal at Lake Gatún- and one in the Marine Laboratory on Isla Galeta on the Caribbean side. These three facilities together have the special value in that each location supports an entirely different ecosystem that amplifies the number of possible topics that can be explored with the school groups. STRI's mission statement behind their programs is stated as ,"If we know how the environment functions, it is possible that we can contribute to its protection. In each of the two Centers (PC and IG) the prime objective is to introduce students to their environment (Ruiz, *Punta Culebra*, 2002)."

Both Punta Culebra and Isla Galeta support a program for the touring public as well as a unique outreach education program that is specialized for the local schools. The program in Punta Culebra is a bit more developed than the program in Isla Galeta, having started as a facility for school groups in 1994 and opening to the public in 1996, where at Isla Galeta has just begun their program within the last two years. At Punta Culebra, the mornings from March to December are reserved for students, presenting two, hour and a half thematic seminars each weekday. The program is free for the participating schools who only need to provide their own transportation (Interview, STRI guide, May 16, 2002). There is a local hotline number to call to make reservations for the school group, in which information must be provided concerning the age level of the students, theme they wish to be covered, number of children, and available dates to visit (Guia para Participar, 2002).

The school children can range in level from preschool to high school students and the theme of the activities can ranging from marine ecosystems, processes, and marine animals (mainly focused on transmitting pure biological knowledge) to the contamination of the marine environment, scientific investigation, and conservation. Each hour and a half program is designed to reinforce and complement activities already taking place within the classroom, which is why the groups are asked to coincide their visits to Punta Culebra with a specific topic they are addressing in the their daily lessons (Ruiz, *Jornadas*, 2002). PC is a unique program in Panama in that is one of the only sites available that allows students to leave the classroom environment and get hands on lesson in a facility equip to teach them (Interview, STRI Guide, May 16, 2002).

There are 18 guides that are trained to lead the schools group through activities. The guides are local college students studying botany, sociology, environmental biology, and microbiology, as well as other STRI staff members (Interview, STRI Guide, May 16, 2002). The guides follow lesson plans that are presented in a workbook designed specifically for STRI's facilities. The presents lessons realized through the following activities: observation of live organisms, experiments, educating games, exhibitions and presentations, and videos. All programs are designed to reinforce knowledge learned in the classroom through fun and animated forms. The workbook also includes take home material titled "extension in the classroom" for the student to continue their learning experience once they leave the facilities (Ruiz, *Jornadas*, 2002).

The location of Punta Culebra offers visitors and students the combination of marine ecosystems with sandy beaches, rocky shores, and dry tropical forests all within a relatively small area. The education programs of Punta Culebra have been strengthened with the construction of instructive panels, in both Spanish and English, which present

information as a reference for guides, professors, and students to help them become familiar with each aspect of ecology and the areas history (Ruiz, *Punta Culebra*, 2002). There are three rooms within the facilities that provide an exhibition center, a video viewing room, and a small classroom. The aquarium has also been equipped with marine aquariums that recreate the differences in habitat that exist between marine ecosystems of both the Caribbean and the Pacific with aquarium tanks containing animals from each environment. The Exhibition Center also includes touch tanks from where can be viewed sea turtles, anemones, starfish, sea cucumbers, snails, sea urchins, fish, and many more animals (Ruiz, *Punta Culebra*, 2002).

3. ReAL- Boquete: Reciclaje, Ambiente, Limpieza de Boquete.

ReAl- Boquete is a Pilot Project that will enter the three largest primary schools in the district of Boquete in the Spring of 2002. The project hopes to generate a change of actions, responsibilities, and consequences with the application of a program that presents solutions and alternatives in resolving problems of environmental contamination to better the quality of life for the community. The program is directed at younger children to bring them to realize the importance of recycling within local schools by setting up a monitoring system, decorating trash cans, and supporting this process with and workshop on the basic ideas of conservation and recycling.

The Project has 3 specific objectives:

1. To equip each of the three schools with a team of less than 15 kids that can serve as monitors and facilitators who can instruct the rest of the students on recycling techniques.

2. To ensure that at the end of one scholar year that at least 60% of the student population has the knowledge and capacity to correctly classify and prepare materials for recycling.
3. To experiment with a simple form of self-management through the recollection, classification and sale of recyclable products (Arcia, 2002).

The program is being organized by a local group of volunteers made up of 5 foreigners and 5 Panamanians. Although the resulting group represents different origins of nationalities, all have the same principal concern for the "accelerating deterioration of the environment taking place in their direct surrounding (Arcia, 2002)". The members of ReAL- Boquete united after a study conducted by ANAM in March of 2002 that attempted to initiate a plan of action (Elaborating- through the development of specific education projects in the local schools) governmental representatives and community organizations to generate a culture dedicated to bettering the quality of life through the process of recycling and disposal of selected items. The initiative, however, made no plans to unite different sectors of the community and the Ministry of Education within the following six months, and ReAl- Boquete began to pull together different residents of the district to discuss possibilities (Arcia, 2002).

When choosing a topic on which to focus, the group was presented with a wide spectrum and a diverse range of problems to select from. The group chose the specific topic of Recycling due to resource availability, the rapid process of recycling, and the obvious evidence of transformation into useful things that recycling can bring (Interview, Arcia, May 10, 2002). "Recycling serves as an alternative to the use of solid waists. Through recycling, we can build a reality in which not all waist products will be turned into

contaminates, harmful gas emissions, or toxic liquids that will increase the degradation of the landscape- but only if we take the proper time to better classify reusable materials (Arcia, 2002)."

The program will enter its first week of contact hours with the children during the first weekend of June this year. As of yet, however, the group is focusing on organizing the initial workshop and creating contacts within the local schools as well as regional and national education authorities. ReAl- Boquete, for the past few months, has conducted 3 hour meetings once a weeks to discuss planning issues, in addition to small committee meeting during the week (Interview, Bennett, May 9, 2002). The planning process for the group, as they are a small volunteer organization, has worked through a series of people and steps just to get the program approved. The process began by contacting the Education Coordinator at the Ministry of Education Office in charge of the province who had to receive authorization from the National Office before he could allow the group to get in touch with school directors. Once contact was made with the schools, communication continued through teachers and parents to finally receive approval to begin the program within the school system. As well as planning for the material and process for which the project will be implemented within the schools, the group has been searching for community and monetary support by writing letters to and businesses asking for funding and by conducting a fundraiser in the form of a charity concert within the Boquete area. They have also been contacting similar organizations asking for advice, material, and support of any kind. The president of the organization, Iris Arcia, also attended a seminar in Panama city during this last December and February titled ' Manejo de la Basura Desechos Sólidos,' that included business representatives from all over the country, bringing

in different perspectives on environmental factors and focusing on teaching the skills to write a project proposal and where to go for support (Interview, Arcia, May 10, 2002).

As for the specifics of the program, with the authorization and support of the Ministry of Education and ANAM, they are planning to implement a pilot program of self management concentrated on recycling on the scholar level (grades 4^{th}, 5^{th} and 6^{th}) in three schools of the largest attendance in the period of one school year. The program will focus on the recycling of white paper, color paper, newspaper, carton and aluminum cans. These products will be bought by certain companies in David that have already been selected to pay for the material- the contract, however, depends on the proportion of the recyclable product and their correct classification and cleaning. These funds will be given back to each school where the teachers and students can decide the best way to appropriate the funds in an account that will be opened under the name of a student and teacher member of the monitor team of the project in each school to deposit the produced money of the sale of the recyclable material (Arcia, 2002).

The monitoring system that is to be implemented within the three schools is all going to be taught in one four hour session planned for June 1, 2002. The seminar is designed to include the participation of not only the students, but also teachers from each school, and parents that wish to participate. Within the four-hour session, ReAL- Boquete volunteers will teach students the importance of recycling on a local, national, and international scale, and show them how to take care of their recyclable materials. The lesson on the 3 R´s of recycling (or 4 in Spanish: Rechazar, Reutilizar, Reciclar, and reducir) are reserved to be taught by an outside specialist from FUNDICCER, a similar conservation group located in the nearby city of Volcan (Interview, Arcia, May 10, 2002). Plans to reinforce the recycling system within the schools include, assigning two volunteers

to each school for follow up meetings, a competition on who can design and decorate the most decorative garbadge can, and organized field trips to the businesses in David that are buying their recyclable materials, and also a trip to the dump (Arcia, 2002).

Analysis

Each program studied offers an example of how education can work to increase environmental awareness and influence behavior to indirectly increase the quality of life for people here in Panama. They are similar programs in that each is an example of non-formal EA, facilitated by organizations outside the school system, which targets children's groups in primary and secondary school. However, each program differs in almost every other way- themes, methodologies, materials, support, funding, and audience. For this reason, it is difficult to compare these education programs and determine how they should be evaluated. Is it more important to have a broad reach of contact with children on a shallow level, or to work with a small number of students in-depth for a long period of time? Is it more important to focus on specific topics, or to provide a general knowledge of the environment and current relevant issues? For this purpose, the education ideologies of several national and international organizations were combined to compile a general list of qualities and requirement for a successful education program.

Environmental education can be described in many different ways by the various organizations that present a form of practice. The above programs all give an example of the wide variety of programs that are possible within the realm of EA. Some programs focus on increasing the general knowledge of the environment to build conscientiousness,

some programs focus on critical thinking and identifying and education about immediate issues in the environment and some programs focus on facilitating the brainstorming and actualization of solutions to these problems. Each is a form of Environmental Education that take a distinct role in the over all transference of knowledge that makes EA a successful process. However, there are certain characteristics and mandatory components that distinguish these case studies, as well as EA in general, from other forms of education that have been determined on an international level.

To be considered an EA program, the program must include:

A Human Component: EA has been characterized as a form of education that creates connections within the sciences, technology, the economy, politics, people and the environment (Quintero de Cárdenas, 2002). This form of education is fundamentally different from other forms of "education about the environment" and pure scientific research in that EA involves not only the instruction and analysis of environmental processes, concepts, and issues, but also focuses on the reciprocal relationship between humans and their surroundings. Solutions to environmental issues depend on a general knowledge of aspects of history, politics, the economy, technology, cultural values and much more (Haley: TEEM). Therefore, EA includes a human component in the analysis of these environmental problems to create ties between the people, their surroundings, and their values.

Knowledge and understanding of the environment and environmental challenges: EA is supported by a fundamental knowledge of sociological and ecological systems. By

studying and understanding the distinct fields that relate and contribute to conservation ideals and sustainable development, individuals acquire an understanding of the variables that influence the state of their surroundings and identify various ways to prevent and improve the situation (Quintero de Cárdenas, 2002). Knowledge is the base for the analysis of environmental problems, conflict resolutions, and the prevention of new problems appearing (Haley, TEEM). Most importantly, knowledge can give an individual the capability to evaluate the context of environmental crisis on their own, and develop individual opinions.

Skill development to identify and help resolve environmental challenges: EA also encourages the development of various skills that can lead to the resolutions of problems. These abilities can include the improvement of communication skills- such as listening, public speaking, and persuasive writing- investigation skills- such as project design, library research, interviews, and analysis and organization of data- and group leadership skills- such as decision-making and cooperation (Haley, TEEM). EA serves to give groups and individuals the capacity to evaluate the state of the environment, identify problems, and apply their skills in bringing about a solution.

Promotion of attitudes of concern for the environment and motivation to improve or maintain environmental quality: EA promotes the development of conscientiousness and concern within individuals and social groups about the environmental situation including its problems, the consequences of human interaction, and the causes of environmental issues(Quintero de Cárdenas, 2002). All humans are motivated by a different system of values which makes it difficult to reach the necessary compromises to create a society

willing to support the trials of sustainable development. However, through the analysis and internalization of experiences and knowledge, people can be driven to better interact with their natural surroundings. Therefore, it is the job of Environmental educators to instill positive attitudes, values and intentions within the community towards their environment (Haley, TEEM).

Constant Process with an active methodology that involves many members of the community: EA can only be a successful tool to protect and better the environment if it is a permanent part of the development and assimilation into ones culture (Objectives, 1997). In order to effectively modify the attitudes and motivations of people toward their surroundings, the process of EA most be present throughout all stages of life, from the pre-scholar level up to the higher level education, incorporating not only the students, but the family, the community, organizations, and other individuals as well. The programs must also be presented in and interactive environment where the participants become involved in the activities and take part in the brainstorming and actualization of the resolutions. Each activity must also include a component that reinforces the lesson on the long-term scale not only in the classroom but also in daily activities at home and in the community. Only through a continual process of repetitive and reinforced activities, can EA be an effective tool for conservation (Quintero de Cárdenas, 2002).

Participation in activities that lead to the resolution of environmental changes: Last, but just as important as the previous components, is the ultimate goal of each EA program. Depending on the background and motivation of the organizations that construct and facilitate EA programs, the mission statement behind program will vary up to a point. However, they will all include activities that ultimately lead to solutions and alternative

ideas that promote the care and management of the environment through any one of the previously noted methodologies (Objectives, 1977): emphasizing human impact on their surroundings, increasing general knowledge and awareness, developing skills that can be applied, modifying attitudes through experiences, continual supportive integrated activities.

Discussion

EA is Widespread but Disorganized:

EA programs here in Panama, not limited to the four case studies, cover a wide array of issues with a variety of techniques. This system works well in that, all of the programs combined, cover the mandatory characteristics of EA utilizing different goals, ideas, and recipients that allows for a wide spectrum of issues to be covered and a diverse array of environmental issues to be challenged. At the same time, each program is not receiving support from any of the other existing programs as there is no coordination between individual programs and no one organization is solely in charge of the steps that must be realized to initiate an EA program.

Also, the concept of a specialty in EA is a fairly new idea here in Panama. There are specialists in certain programs, but no one person knowledgeable of the general EA plans of the country (Interview, Aviles, May 7, 2002). This disorganization, not only, makes it difficult for organizations to look for assistance, and it complicates the process of beginning a program when it is nearly impossible to know the proper contacts to make and the proper steps to take (Interview, Arcia, May 10, 2002).

EA is a collaborative Effort:

No one organization in Panama is capable of conducting their own EA program without the aid of outside contributors. On the one hand, this is beneficial because it supports the interaction between many groups, which increases the possibility of success in developing, facilitating, and continuing their programs. However, at the same time, the process of beginning and implementing a program is difficult because of the many laborious steps that must be taken: receiving permission from the proper authorities, acquiring the adequate material, making the correct connections with program sites, designing a plausible program, facilitating interactions between each contributing organization, acquiring sufficient funding, and determining what the needs are and where the support should come from (Interview, Arcia, May 10, 2002).

It is not only that individual programs do not have the capability to run alone, but also that they will not be accepted without the proper affiliations. Teachers, schools, communities, and donating businesses will not contribute aid to an EA program unless they have taken the proper steps and can show proof of the proper support and collaboration (Interview, Arcia, May 10, 2002). It is a self-promoted problem.

EA is still in the early stages of Development:

Programs in Panama are new and developing. Each program within the case studies have just as large of a list for expansion ideas as they have a list of accomplishments. Each program is in the immediate stage of growing and developing and expanding. The expectation was to find programs at different levels of development, but all are at such early stages that each is dealing with almost the same issues of maintaining and increasing

support for their programs, and finding funding and willing participants. Each program is also limited in that many have the capability and the info structure to expand, but lack the governmental support and funding (Interview, Aviles, May 7, 2002).

It was also hard to analyze and compare the case study programs because it was initially hard to investigate and separate them into well defined program goals and limits. EA programs in Panama seem to just be at a freefall to interact with the school systems in whatever manner is quickest. Since there is such little organization and regulation, the programs are free to switch topics, develop their own material and add on smaller outreaches to the programs as they go.

For the same reasons that the programs maintain flexibility through a lack of regulation and organization, teachers and school facilities are slow to donate their time and support, making it difficult to maintain programs within the schools. It is difficult at times to motivate and give the proper incentives to get teachers to participate, because in the past so many programs in early development have failed leaving the children halfway through the facilitation (Interview, Bennett, May 9, 2002). The president of ReAL- Boquete commented that you had to be very persuasive and hand the program to the schools in a neatly sealed envelope, and present the mandate from the Ministry of Education (Interview, Arcia, May 10, 2002). Although participation in many of the programs are free for the schools, many of the programs also require teachers to attend 40-hour seminars each year so they can instruct the material or use the facilities of the programs (Interview, Quintero de Cárdenas, May 27, 2002). This can be overwhelming for an already overworked teacher, and the EA programs must depend a lot on self-motivation on the part of the instructors and facilitators.

TRENDS + Direction

Since the date panama recognized EA as a national strategy to conserve and develop natural resources, and preserve the environment in 1992, EA has come a long way. The trend of EA in Panama seems to be moving in the direction of international support and the slow development of affiliations between governmental organizations, local institutions, NGO's, and community groups. There have been several, international and national conventions that have sought to collaborate materials, ~~facilities~~, capabilities, and knowledge (→

(TEEM Seminar and 'Manejo de la Basura Dosechos Sólidos'). There has also been a growth of smaller independent organizations that are being recognized and asked to help support the governmental and larger, more established organizations. Finally, there is a movement toward improved collaboration between larger organizations with better-defined roles and participation levels and expectations.

Recommendations

1. Developing programs with better organization and focus whose goals and expectations are well identified and well promoted within communities

2. Program expansion to reach a larger audience (including age groups and classrooms), for a more prolonged period of time that can also include a larger percentage of the community

3. Better funding for EA programs that can be appropriated in a simple process

4. An easier system of implementing programs and receiving governmental support for organizations on the local level

5. Improved collaboration and communication between national organizations with better defined roles, participation levels, and responsibilities

6. A better defined national statement of the specific methodologies that should be used and tasks that should be accomplished through the means of EA

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