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GreenCOM 5th Technical Advisory Group Meeting

Final Report



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Technical Advisory Group Meeting

Summary Report

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EXECUTIVE SUMMARY

The Fifth Technical Advisory Group (TAG) meeting of the Environmental Education and Communication (GreenCOM) Project was held on January 13 and 14, 2000, at the Academy for Educational Development in Washington, D.C. This report provides a brief overview of presentations made by the GreenCOM team describing the applied research activities and the state of the project as a whole. This report also attempts to draw overall content and recommendations from the discussions and consultative sessions regarding GreenCOM's most important lessons and successes as well as what is needed from USAID for future Environmental Education and Communication (EE&C). A copy of the meeting agenda is provided in Annex A.

The purpose of the annual TAG Meeting is to review GreenCOM's applied research activities and provide guidance on the development of future research endeavors. The meetings further assist the project in achieving its goals within the strategic framework of the U.S. Agency for International Development's (USAID) Center for Environment, the Center for Human Capacity Development and the Office of Women in Development. GreenCOM also uses the opportunity to highlight its major accomplishments and obtain guidance for upcoming communication and educational interventions.

TAG members, GreenCOM staff, USAID project officers and guests attended the meeting. The participant list is included in Annex B.

TAG members were asked for their input regarding:

- Strategies for "heating-up" the environmental agenda
- GreenCOM's most important lessons and successes
- The critical elements of sustainability
- The future of EE&C

Suggestions from the TAG included:

- Educate local policy-makers and international donors regarding the value of EE&C in creating synergy across sectors and programs.
- Translate the best science in communication campaigns to build constituencies and public policy.
- Build alliances with the private business sector (e.g., "green" industries) to expand EE&C programs and impact.
- Have someone of influence in each project country to adopt central ideas of programs.
- Create ways to legitimize and mainstream the environment. For example,
 - Organize "Green-business" symposia, and/or
 - Institute "Green-permits".
- Create cross-institutional teams for EE&C research and development.
- Adopt strategies that showcase many people at one time this will generate awareness, general interest, and involvement among the rest of the population
- Interventions/events must have continuity. Preferably
 - They should be done annually
 - They should create a tradition.

- Adopt regional strategies, create ways for people to act/compete with other communities (Central American Environment Award).
- Build regional coalitions for EE&C around primary themes such as protected areas and eco-tourism in Central America; water conservation in the Middle East; trans-boundary water management in Southern Africa or marine resources protection in the Caribbean.
- Create a backdrop where change is possible/Create sensitivity.
- Expand EE&C capacity through new information technologies disseminating best EE&C model through web-based networks. Electronic media can play an increasingly important role in disseminating information, developing awareness and changing attitudes.
- Develop protocols and methodologies for cross-regional learning in EE&C.
- Evaluations must explore the extent to which engaging different sectors of society in discussions about environmental protection leads to environmental protection actions.
- Strengthen EE&C networks and associations among countries and projects, including developing stronger ties with organizations such as North American Association of Environmental Educators (NAAEE) and National Association of Interpreters (NAI).
- Continue building environmental behavior-change models drawing from lessons in other sectors such as health.

The use of “self interest” approaches (such as contests, prizes, competitiveness among the private sector) would seem to be a very successful way to lay the groundwork for more “mechanistic” approaches that deal with government ministries, budgets, policy, etc. Involving stakeholders at the most basic level of the technical assistance allows for continuation of the activities once GreenCOM’s role in-country is over. Important questions to ask in terms of sustainability are:

- Do the communities see direct benefits from the interventions?
- Are they experiencing a better standard of living?
- Do ministries enjoy political benefits?
- What should the next steps be?

Other important factors for sustainability are the length of the project (longer is better, such as El Salvador and Egypt) and identifying people in-country who are willing and able to continue the work. It was suggested the AID should have a greater investment in fostering leadership roles among stakeholders, including using more regional professionals, especially because of the perceived “insularity” of Washington, D.C., with respect to the developing world. The projects should “not only teach but learn,” and donors should value the first-hand experience of the people in the field and allow for a two-way flow of ideas. Sustainability can also be supported if donors provide grants to NGOs to strengthen their capacities in EE&C.

By the same token, provide an avenue that permits continuity over time. Consider even the possibility of providing endowments that may allow institutions to implement projects over the long run. Plan gradual pull-out of countries avoiding sudden termination of interventions.

In conjunction with the idea of longer projects, donors need to think about environmental issues in global terms by identifying major issues and then targeting countries for application. In other words, specialize in topics and provide in-depth support to a limited number of countries where different tools are applied and tested.

GreenCOM is known in the countries in which it has worked, but needs to expand its presence throughout the world. In this way, it could help create a broad guideline for “what does and doesn’t work.” With respect to lessons learned, address the issue of the type of changes that project planners can expect in the future, including the sequence of behavior changes that may be possible.

GreenCOM must continue to look into non-traditional places where sustainability may be created.

The TAG Members also suggested:

- to develop sustainable funding strategies for EE&C involving both the public and private sectors, and
- to prevent GreenCOM’s vision and capacity from dissipating, maintain a strong EE&C presence in USAID program strategies and funding.

BACKGROUND

GreenCOM is the Environmental Education and Communication (EE&C) Project of the United States Agency for International Development (USAID). Initiated in October 1993, GreenCOM has a seven-year contract with USAID's Bureau for Global Programs, Field Support and Research. The Technical Advisory Group (TAG) meetings assist the project in achieving its goals within the strategic framework of USAID's Center for Environment. In particular the TAG aims to ensure that GreenCOM's applied research activities constitute a valuable contribution to efforts to promote sustainable living resources, sustainable energy use, and sustainable cities. Other USAID objectives addressed by GreenCOM include improving basic education and embedding gender analysis within each project activity.

GreenCOM has worked with USAID missions, bureaus and host countries to address a wide range of environmental concerns, from municipal solid-waste disposal, water and bio-diversity conservation, to community management of forest and coastal resources, greenhouse-gas reduction, environmental policy formulation, training, and advocacy. Presently, environmental education and communication (EE&C) activities have been completed, or are now being carried out by GreenCOM, in 29 countries. Six of these are "emphasis" countries: Egypt, El Salvador, Mali, Panama, the Philippines and Tanzania. To date, GreenCOM's applied research activities across these countries include 45 formative-research studies and 14 impact-evaluation studies. Gender analysis, or the exploration of differential roles, views and/or effects of an intervention by gender, is an integral component of each project activity.

The fifth TAG meeting of the GreenCOM Project was held on January 13 and 14, 2000, at the offices of the Academy for Educational Development in Washington, D.C. The purpose of the annual TAG meeting is to review and critique applied research activities completed by GreenCOM during the past year and provide expert recommendations regarding the project's future applied research agenda.

The TAG members are a voluntary advisory group of professionals and academicians who are recognized experts from a wide range of fields. These specialists bring a diverse set of skills and experience to bear upon the field of Environmental Education and Communication. TAG members in attendance at the meeting were: John Baldwin, Lynne Hale, Robert Hornik, Tiahoga Ruge and Miguel Araujo. Brief biographies of each TAG member are provided in Annex C.

The primary objectives of the 2000 TAG Meeting were to:

- Showcase GreenCOM lessons and successes
- Illustrate the impact of GreenCOM programs
- Show the value of research
- Receive input from the TAG on future EE&C

GreenCOM uses the input provided by TAG members to enhance the design and emphases of its applied research activities. TAG members' recommendations will further assist GreenCOM in identifying those methods and evaluative techniques used by the project which have the strongest potential for contributing to the field of EE&C, and should thus be the focus of dissemination efforts.

The structure of this report follows the agenda of the meeting. The first session highlights GreenCOM's lessons and successes. This session summarizes introductory remarks, highlights a discussion on how GreenCOM has been effective with comments from mission representatives and government counterparts, and addresses how GreenCOM has contributed to "heating up" the environmental arena. The second session focuses on how research can improve programs. This session includes summaries of presentations on research activities in three sites, and a dialogue about a new model for training in Central America. The third and final session provides a summary on sustainability and seeks to answer the question "what happened after GreenCOM left"? This portion will also include remarks from the TAG members regarding GreenCOM's most important lessons and successes, and what is needed from USAID for future Environmental Education and Communication.

FIRST SESSION
LESSONS AND SUCCESSES

MEETING INTRODUCTION

Opening Remarks

David Hales, Deputy Assistant Administrator for the Environment Center/USAID, stated that GreenCOM provides vision and leadership to others in the field of EE&C. In our work we need to know what is changing, why it is changing, and how to apply our learning in the next project and in the next geographic area. Mr. Hales indicated that GreenCOM is not only visionary with regard to these needs but that it deals with issues the hard way – through baseline studies and peer-review articles. GreenCOM plays an important role in the field of governance. For example, video letters presented to Ministries will be used as tools for empowerment.

Emily Vargas-Baron, Deputy Assistant Administrator for the Human Capacity Development Center/USAID, stated that in the past there were 20-25 countries in environmental crisis. Currently that number has increased to 57 countries. These are countries where refugees are spilling over borders and bring and/or create environmental problems. Refugees use resources and systems break down. For example, irrigation systems cannot supply the demand for water that newcomers need. Ms. Vargas-Baron noted that we need to address how to help these populations heal their environment. She remarked that USAID has been involved in El Salvador since after the war and part of the effort is to reconstruct what was destroyed. The ecological/environmental message may be better appreciated in a reconstruction setting.

Mike Philley, GreenCOM Technical Officer/USAID, addressed the application of social marketing and how different audiences can be motivated to change their behaviors. Mr. Philley stressed the need for programs to be monitored and noted that research plays an important role in doing that. Making use of AID's R4's helps to develop an "adaptive" management program.

Tony Meyer, Project Officer, Human Capacity Development Center/USAID, suggested that there is a kind of "vigilante logic" at play. Professionals who know how to change behavior need to be the Agency's vigilantes. Mr. Meyer stated a need to look for creative elements (e.g., using the Internet). He stressed that the need for this type of work has by no means expired and that we need to look for global solutions to global problems. For example, regional coastal-management approaches might make more sense than country-based approaches. Mr. Meyer felt that the role of the TAG is to interpret what is out there into usable bundles for the Agency.

HOW HAS GREENCOM BEEN EFFECTIVE

Presenters: Lars Klassen, Miguel Araujo

Lars Klassen, USAID Mission Director/Panama, stated the objectives of USAID's EE&C portfolio in Panama:

- Consciousness-raising about the utilization of natural resources
- Working with GreenCOM (only 2 NGOs in Panama)
- Creating advocates for protecting the Panama Canal watershed
- Taking care of trash problems

The challenge in Panama is that civil society is weak and it will take time to get citizens to become advocates for change. To meet its objectives AID is creating partnerships on the national and municipal levels, as well as with civil society and the private sector. AID seeks to help the Panamanians lead the effort to protect the watershed by first increasing awareness and then changing behavior. To raise awareness the Mission plans for campaigns to address what the watershed means for the Panamanian economy as well as educational activities for children in school.

Regarding trash collection, AID is seeking partnerships with three out of every four municipalities and with the private sector. AID also plans to train tour guides and develop skills of agro-forestry professionals.

Miguel Araujo, former Minister of the Environment in El Salvador, spoke about the environmental achievements in his country. Mr. Araujo compared El Salvador to Massachusetts in size and said that if the level of environmental action in Massachusetts was similar to what was going on in El Salvador it would be front-page news. Such action includes how SEMA, the Secretariat of the Environment, became the Ministry of the Environment. This was accomplished by proving the level of economic loss to El Salvador due to environmental degradation. In 1998, the economy of El Salvador grew 5%, but loss due to El Niño and Hurricane Mitch was also 5%, wiping out any economic growth. This made the government take notice.

Mr. Araujo stressed that people are beginning to understand that the environmental community works with development, not against it. This is an important threshold to pass because once people understand that the environmental and development communities can work together, unity can be achieved. Mr. Araujo presented a CD-ROM that uses interactive video in a browser format to summarize the work done by the Ministry. The book "El Libro Verde" was also presented as another example of how to increase awareness about the impact human activity has on the environment.

Mr. Araujo stated that GreenCOM helped to generate the synergy that allowed such change to occur in El Salvador.

GREENCOM OVERVIEW OF ACHIEVEMENTS

Presenter: Brian A. Day

GreenCOM Project Director Brian Day presented an overview of GreenCOM's work from the past six-and-one-half years. Mr. Day highlighted a number of achievements that were discussed more in-depth in the following sessions. GreenCOM's work has spanned 29 countries and over 30 delivery orders. Projects have ranged from \$25,000 to \$4 million and have lasted from 2 1/2 weeks to 5 years. The breadth of these projects reflects GreenCOM's attention to priority areas for USAID environmental assistance.

- Formal Environmental Education
- Non-formal Environmental Education
- Water
- Protected Areas and Parks
- Forests
- Coastal Areas
- Solid Waste
- Biodiversity
- Greenhouse-gas reduction
- Global Climate Change

Mr. Day introduced GreenCOM's methods handbook, titled "Exploring Human Nature: Using EE&C Strategies for International Development," which will be coming out soon. The handbook synthesizes GreenCOM's experiences into four sections:

- Fundamental Concepts of EE&C
- Planning EE&C Programs
- Conducting EE&C Activities
- Putting it All Together

In closing, Mr. Day stated that consistency and duration are the key factors for projects to be a success. He stressed that EE&C needs to have a tangible effect on the environment and that there are still some outstanding needs in certain countries, including:

- Tools
- Knowledge, Attitudes and Practices of Target Groups for EE&C Interventions
- Participation
- Campaign Development
- Building the Profession
- Meetings
- Publications
- Global Network of EE&C Professionals
- Model development
- Serious research in areas requiring fresh approaches

CHARGE TO THE TAG

Presenter: Susan Middlestadt

Susan Middlestadt, the director of AED's Center for Applied Behavioral and Evaluation Research and research advisor to GreenCOM, set up the day-and-a-half of activities for the TAG.

The TAG was asked to provide input with respect to the following questions:

- What are GreenCOM's most important lessons and successes?
- What effective strategies have been developed to "heat up" the environmental agenda?
- What are the critical elements for the sustainability of EE&C programs?
- What recommendations can be made to improve how applied research in support of EE&C programs can be used?
- What elements should future EE&C programs include?

PUTTING ENVIRONMENT ON THE NATIONAL AGENDA: DOES HEATING UP WORK? A PANEL OF SUCCESS

Presenters:

Irma Allen, Resident Advisor, GreenCOM/Tanzania

José Ignacio Mata, Chief of Party, GreenCOM/Panama

Peter Spain, Administrative Director, GreenCOM, AED

Rick Bossi, Latin America Coordinator, GreenCOM, AED

In many countries, the people who are aware of and committed to improving and protecting the environment are acting locally but working in isolation. In designing GreenCOM, AID identified key challenges for environmental education and communication:

- How can we broaden the awareness of environmental issues?
- How can we engage a wide range of players from all sectors of society?
- How can we put the environment solidly on the national agenda?
- How can we use environmental educational and communication tools to cross national lines?

Heating up is a process of starting with the small and building to the big. Brian Day led a panel of GreenCOM staff in describing four strategies for heating up.

1. Environmental Awards Schemes

The first strategy was presented by Irma Allen, the resident advisor for GreenCOM/Tanzania. The strategy, Environmental Awards Schemes, was developed by Ms. Allen initially for use in The Gambia. Awards schemes are a form of social mobilization engaging various stakeholders (schools, businesses) to build public awareness across all levels and sectors of society. The goals of the project in The Gambia were:

- To lay the foundation for integrated environmental management
- To support other private voluntary organizations (PVOs)
- To use EE&C to support policy

Contests are frequently used by public and private institutions in many countries to interest citizens in some certain concern. In The Gambia, competitions took place on regional and national levels in eight different categories, including those relevant to schools, businesses and voluntary organizations.

Awards are given on the following bases:

- All schools and educational and vocational institutions
- Activities: clean up, tree planting, school /community projects

- Individual Competition (fishermen, journalists, teachers, women, youths, leaders, etc.)
- Activities: environmental advocacy
- Group/Village Competition (villages or Groups, e.g., women's groups, community-based organizations, associations, cooperatives)
- Activities: sustainable fishing, cooperative waste management, beautification activities, etc.
- Industries/Enterprises Competition (Businesses, enterprises, and industries)
- Activities: use of environment-friendly technology and practices

Five factors were important to this awards scheme's success:

1. Mobilization – people throughout the country were involved
2. Decentralization – local and regional groups had power and authority
3. Feasibility – low cost and pooling of resources
4. Communication – all communication channels were used systematically
5. Time – there was sufficient time to sensitize the public, mobilize resources, and build support

The meetings, media coverage, posters and other dissemination methods that were an integral part of the awards scheme proved an effective springboard for broader discussions on environmental problems and solutions, involving many more people than those who formally entered the competition. The prize-giving ceremonies were very large (between 3-4,000 people) and involved parades and music groups.

The initial assessment on the part of the local groups was that they would be unable to do it but to this day, long after GreenCOM has left the Gambia, they are carrying on the work.

2. National Encounters

José Ignacio Mata, former Resident Advisor for GreenCOM/El Salvador, presented the case of the National Encounter that took place in El Salvador in November 1996. GreenCOM and SEMA (what became the Ministry of the Environment) organized the encounter using newspapers and other media. The goal of the National Encounter was to empower civil society to help the environment.

The Encounter was put on at the national level and involved the President of El Salvador and Ministry officials. One of the first steps to implementing the Encounter was synthesizing different perspectives on education (formal, NGOs, mass media). Over one thousand representatives of all environmental NGOs, universities, schools, educational institutions and the mass media attended. At the encounter, 150 specialists from different educational areas participated in 18 simultaneous workshops. The results of these workshops and the meetings were consolidated and analyzed. A National Guideline for Environmental Education was produced from this analysis.

3. Video Letters

GreenCOM has been involved in two different experiences with making video letters. The first experience took place in Nepal and was described by Peter Spain, Administrative Director for GreenCOM. Mr. Spain explained that the purpose of the video letters in Nepal was to try to connect the villagers to the government on issues about forest resources. In 1978 control of forests was given back to communities by the government of Nepal. Since then, control of the

forests has taken different forms but more recently the people who made the policy have struggled to understand how community forest-user groups (CFUGs) operated and how CFUGs were getting the forest back to where they could use it again. Video letters were the tool to get these messages heard. It is through the use of video that the villagers were able to speak from their hearts about their forests.

The video letters were developed, produced and edited by the villagers. GreenCOM/Nepal Resident Advisor Kedar Sharma documented the process of how the villagers were taught to make the videos. When the video-making process ended two of the villagers went with Kedar to Kathmandu to edit the video letters and others came to speak in person to the government during a Community Forestry Forum.

This experience helped give credibility to the idea that communications can help bridge the gap between the village and the government.

Tanzania was the setting for GreenCOM's other adventure with video letters. GreenCOM/Tanzania Resident Advisor Irma Allen described this experience. As with Nepal, one of the reasons for using video letters was to give a voice to a local population and to make sure their voice was heard by the government. However, in this case GreenCOM contracted with a local video-production firm to videotape the inhabitants of coastal communities during different visits. Rather than "telling a story," the people were filmed on the spot doing certain activities (fishing, planting mangroves). Copies of the video "Voices from the Coast" were sent to parliamentarians and decision-makers. The impact of these video letters is yet to be documented.

4. Postage Stamps

Rick Bossi, GreenCOM's Latin American Coordinator, described a campaign to promote the richness and diversity of Nicaragua's protected parks by using postage stamps. Mr. Bossi stated that the initial challenge stemmed from Nicaragua's image problems. Part of that problem was tied to the old tourism slogan – "Nicaragua opens its arms to you," a slogan all too suggestive of the country's recent strife. A new slogan was developed - "Nicaragua Naturalmente" (Nicaragua, of course!!!)

GreenCOM sought to educate the local people and potential international visitors about how much diversity the country has and to strengthen the capabilities of local NGOs at the same time. Working with USAID/Nicaragua Environment Officer and professional photographer Jerry Bauer, GreenCOM and Fundación Cocibolca (a Nicaraguan environmental NGO) developed a series of stamps and posters to get the message to the world about how much Nicaragua has to offer. Fundación Cocibolca brokered the deal with the Postal Service to release the stamps. When the materials were released, the public and even the Minister of the Environment had a hard time believing that such places existed in Nicaragua.

The stamps started as an idea of how to get the message to the citizens of Nicaragua and the whole world. To date, the Postal Service has donated 25% of revenues from the sale of these stamps to Cocibolca's EE&C activities and continues to maintain a successful partnership with Fundación Cocibolca. This foundation has agreed to take the lead in getting the NGO community to manage protected areas. The proceeds from the sale of stamps will help Cocibolca meet its commitments in this regard.

DISCUSSION: HEATING UP

How do we get these strategies out there for other people to use? How do we build on this? What makes it all work? Other comments...

- Have someone of influence in these countries to promote the idea/program.
 - district authorities in The Gambia for Awards Scheme
 - President of El Salvador for Encounter
- The successful strategies showcase many people at one time
- Make it fun (Awards Ceremonies)
- Sense of “publicness” (acceptance of idea among public) is different than reaching people through media
- Events such as the award ceremony, National Encounters, etc., must have continuity
 - better if done annually (Awards Schemes)
 - creates a tradition
- Create way for people to act/compete with other communities (Central American Environment Award)
- What happens after an Encounter?
- Create a backdrop where change is possible/Create sensitivity
- Create way to help legitimize and mainstream the environment
 - “Green-business” symposium
 - “Green permits”

SECOND SESSION
HOW RESEARCH CAN IMPROVE PROGRAMS

RESEARCH AND COMMUNICATION: ESSENTIAL PARTNERS FOR SUCCESS

Presenter: José Ignacio Mata, Vice President, AED; Former Chief of Party, GreenCOM/El Salvador; Current Chief of Party, GreenCOM/Panama

Mr. Mata presented the results of a project in El Salvador designed to improve knowledge, perceptions and practices about water for human consumption in 18 municipalities of three watersheds. USAID asked that this project produce results in only one year.

Three tools were used to do so:

1. A survey evaluating people's perceptions about water quality and potential solutions.
Following the results of this survey, USAID developed indicators that defined what would be needed.
2. An integrated communication strategy.
3. A study monitoring the impact produced by this project.

1. Results of the survey

The study focused on: (1) the number of households complying with USAID's minimum threshold for access to water in terms of quantity and quality, (2) people's perception about access to water, (3) quality of water, (4) knowledge of causes and consequences of poor water quality, (5) knowledge about solutions for clean water, (6) knowledge about what kind of actions can be taken to improve water quality – two options were provided, chlorinating and boiling.

According to Mr. Mata, findings suggested that:

- 71% of households did not have access to water in the quantity and quality called for by USAID minimum standards
- 68% thought there was sufficient water
- 79% believed that water quality was good
- 17% of the women could identify one cause and consequence that affected the water quality, compared to 15% of the men surveyed
- 34% of the men knew a solution for improving water quality, compared to 32% of the women

2. The communication strategy

The communication strategy for El Salvador involved:

- A local communication campaign using radio spots, posters and a flyer: "Cantarito's healthy stories."
- Local mobilization activities such as water festivals and fairs.
- Training on water sustainability for mayors, local technicians, teachers and members of local organizations.

3. Final results of the project

A new study was produced measuring people's knowledge and practices, after six months of intervention. Findings showed a dramatic increase in people's awareness about the water quality in El Salvador, as well as the actions they could take to improve the water quality. An important

result of this project was the increased number of new projects and activities developed by the municipalities addressing water issues (a total of 84 new projects and activities).

An important factor to consider is that Hurricane Mitch occurred during the period of time that the evaluation took place. Concern for water quality certainly increased as a result of the destruction from the hurricane. In addition, other agencies intervened to disseminate messages about water safety.

Comments/Questions

- How does research actually affect the development of the campaign?
Doing the survey raises awareness of the issues even before results are in.
- What is the value of each of the tools used?
Mr. Mata responded that it cannot be determined how one tool, in a package of tools, affects an outcome. He indicated that it is very important to constantly evaluate and adapt the campaign. Learn how people in the field are responding and adjust as necessary.
- How much intervention is needed?
There is no formula. In this particular case, water was a very sexy issue. But, one could conclude that this project was more than an intervention, it was an invasion.

INFUSION CAN IMPROVE ENVIRONMENTAL KNOWLEDGE AND ATTITUDES – WHEN DONE WELL: EVALUATING ELEMENTARY SCHOOL CURRICULA IN MALI

Presenter: Orlando Hernandez, Applied Research Director, GreenCOM, AED

This presentation dealt with GreenCOM's school-based work in Mali and specifically addressed the infusion, or incorporation, of environmental content into the elementary school curriculum.

Dr. Orlando Hernandez explained that the school-based intervention cut across two USAID/Mali strategic objectives, the first one on youth and the second on information and communication. The GreenCOM school-based component was expected to increase the knowledge of targeted students about priority environmental themes; to do this, a teacher's guide was produced and teachers were trained in its use.

Before discussing the research methodology used in this school-based intervention in Mali, Dr. Hernandez noted that, programmatically, it is important to infuse environmental content as opposed to creating a stand-alone class which addresses environmental topics and concerns. By that he meant that environmental content must be omnipresent. In general, infusion is suggested for philosophical, practical and administrative reasons. On the technical side, the fact that the environment is addressed in different subject matters establishes stronger links between education and reality. On the practical side, the environment is not buried in other course content and it does not get "lost", but rather it is recaptured and repositioned in every subject matter and presented from different perspectives. On the administrative side, stand-alone subjects addressing environmental concerns are the first to be cut when budgets are reduced. Infusion is one way of guaranteeing survival of environmental content.

Research Methodology

In this particular case research played an important role at different moments of the intervention. As a first step, the Ministry of Education used research information to select the most commonly

mentioned topics across departments to define its environmental curriculum. These were desertification, firewood harvesting, firewood reduction technologies, and erosion. Subsequently, GreenCOM used research information to identify how each one of those priority topics was addressed in the curriculum, to determine how they could be best infused in all subject matters. An infusion model was developed and a teacher's guide prepared. The teacher's guide provided practical ideas and examples of how the topics of interest could be addressed in subject matters such as French, Math, and History. Prior to putting the teacher's guide to use, GreenCOM validated it with district supervisors, principals and teachers who came together in different meetings to provide their input and finalize the document. Once the teacher's guide was validated, it was used to train teachers in pilot schools.

Where that training ended, additional research activity measured student knowledge and attitudes to evaluate the impact of infusion.

School-based intervention

The school-based intervention took place in 18 schools, both public and private. In total 90 teachers were trained. All of these teachers taught students from the 3rd to the 6th grade. In Mali, the elementary curriculum is prepared by two-year cycles: 1st and 2nd grades, 3rd and 4th, and 5th and 6th. The intervention focused on the last two cycles. The level of infusion of environmental content was determined by examining the lesson plans teachers prepared. Four weeks of lesson plans were examined over a two-month period. Class content was corroborated with student notebooks. A maximum of 10 notebooks was used per class for this purpose. This information helped to classify teachers into three levels of infusion:

- **Level 0** included teachers who had not been trained. These were teachers who had been assigned to the schools after the training had occurred.
- **Level 1** included teachers who practiced infusion part of the time and in part of the subject matters and who described themselves as teachers who sought special opportunities for environmental content to be incorporated into their work.
- **Level 2** that included teachers who practiced generalized infusion and environmental content was observed in many if not most of their class plans throughout the four weeks of analysis.

The Student Survey

Following the teacher-training intervention, two surveys were done, one at the beginning of the school year and the other at the end, about two to three weeks before school was out.

Approximately 2000 children were involved during each measurement, using a test including both knowledge and attitude items. Research findings indicated that:

- For 5th and 6th graders: the Level 0 of infusion produced no significant variation in student knowledge. However, both Level 1 and Level 2 of infusion produced significant increases in student knowledge. Significant increases in environmental attitudes among both boys and girls in the fifth and sixth grades were found, with the largest gain among girls.
- In the case of the 3rd and 4th graders the results of the survey show that environmental knowledge remained constant for students in classrooms with teachers practicing no infusion, and that environmental knowledge decreased significantly for students in classrooms where teachers practiced what we have called opportunistic infusion. Knowledge increased significantly among students in classrooms where the highest level of infusion was practiced.

Dr. Hernandez concluded that the data showed that for the younger children in the sample, infusion CAN generate the expected results if practiced well.

Questions/Suggestions

- Further isolate the impact of teacher experience on student knowledge and attitudes. An alternate plausible hypothesis for the detected changes is that the classes were being implemented by more experienced and better teachers. That is, increases in knowledge and improvement in attitudes may have been observed not only in classes with a higher level of environmental infusion but also in other content areas.

EGYPTIAN FARMERS AND WATER CONSERVATION: MAKING RESEARCH PAY OFF IN COMMUNICATION

Presenter: Louise Kemprecos, Research Consultant, GreenCOM/Egypt

Ms. Kemprecos's presentation focused on the communication strategy developed in Egypt in conjunction with the Ministry of Public Works and Water Resources on the use of water resources. She organized her presentation in three parts: a) background information on the project, b) how the research-based communication activities were designed, and c) recommendations for future projects.

Background Information

The most recent GreenCOM project in Egypt was short – only 30 months. The goal was to improve the allocation of water resources by beginning to “privatize” decision-making in the sector that consumes the greatest proportion of water – agriculture. The project's objectives were to improve communication with water users, increase farmer participation in decision-making, and in the long run help to change farmer behavior toward water resources.

Two sets of activities were undertaken – training and media campaigns. The purpose of the training was to establish “partner” relationships between the central Ministry, district irrigation engineers, and farmers. The media campaign was targeted at farmers, the general public, and children. Due to the short duration of the project, changes in knowledge and attitudes towards water resources were anticipated, but behavior change was not.

Research-Based Communication Activities

GreenCOM activities were directed at three target groups: district engineers, farmers, and the general public. In summary the project:

- Undertook a substantial volume of research.
- Undertook a baseline survey of district engineers in the fall of 1997 and an impact survey of engineers at the end of the project.
- Undertook a large national survey of almost 2,500 farmers and their spouses.
- And, for the general public, undertook a nationally representative omnibus survey of 1000 respondents, and analyzed monitoring data from the airing of the media campaign.

Results of the Survey on the General Public

Ms. Kemprecos indicated that the general public was a new target audience for the Ministry, and no data existed on their knowledge or attitudes towards irrigation water. A cost-effective research tool called an omnibus survey was produced and conducted by MEMRB, a market research firm.

The survey showed that only 39% of the general public knew that the amount of water available to Egypt was fixed, 50% knew that Egypt might face a water scarcity, only 4% knew that 10 countries share the Nile, but 90% thought there was a problem of canal pollution. This audience research indicated that messages for the general public were not to be focused on pollution, but rather on the fixed nature of the water supply. Three thirty-second spots were designed for the general public to convey such messages.

The exposure of these messages was later measured a few months after the conclusion of the campaign. In this case, a media monitoring company tracked the airing of all six spots on all eight television channels. By matching up the actual airings data with media habits drawn from their annual media habits survey, the monitors were able to estimate that almost 26 million Egyptians saw the spots at least once. Fully 84% of the target audience, Egyptians over age 15, watched the spots more than three times. Over the three-month period, each person in the audience was exposed an average of 37 times to the campaign.

Information about frequency of airing provides Ministry program planners information they need to liaise with Radio/Television Unit to ensure that the campaign is actually broadcast and to assess when a new campaign is needed, and audience-exposure data give planners information they need to determine when to evaluate message recall.

Results of the Survey on Farmers

In the case of the farmers' audience research, a high-quality research company was contracted to carry out a large, national survey of farmers, selected from among 9400 farmers on 240 irrigation canals throughout the country. This provided a very high-quality sample frame. Two thousand farmers were interviewed, providing detailed information about farmers' knowledge of the national water situation, on-farm water management, their pattern of information-seeking, and their actual water-management practices.

The results of the survey showed that:

- Only 2% of farmers knew that 10 countries share the Nile
- 61% knew that Egypt has a fixed water supply
- 20% knew at least one way a farmer can save water
- Not one farmer had ever asked an irrigation engineer for advice in crop selection.
- And 30% of rice farmers had grown a short-duration variety of rice in the previous summer.

The audience-research report concluded with a list of 20 specific messages for farmers. These recommendations were a main input into the design of six sixty-second television spots aimed at farmers. The spots contained five key messages. In addition, eight double-sided fact sheets were designed to convey these messages to farmers.

Results of the Survey on District Engineers

The district engineers' audience research identified specific gaps in engineers' knowledge, and skills which they needed to encourage greater farmer participation in decision-making. The survey indicated that only 53% of engineers had heard of a Water Users Association, only 35% knew enough about the Nile's regional context to know that 10 countries share it, only 60% knew that Egypt could face a problem of water scarcity in the future, 69% thought that farmer

participation in decision making was a good idea, and only 33% had ever held a meeting for farmers.

The audience-research report provided:

1. A list of 16 specific topics to cover in training for district engineers.
2. A set of 22 baseline indicators and estimated target values for each.

This audience-research report and list of topics were also used as a main input to curriculum design for training district engineers. The final two-week curriculum included Ministry policies, facts about water distribution, a vision of the ideal behaviors that an engineer would do in his job, and skills in problem solving, communication, and meeting management to help engineers have the confidence to arrange and direct successful farmers' meetings.

At the end of the project, the baseline survey was repeated to measure impact and this second survey showed statistically significant improvement in almost every indicator. We hit or exceeded the target value on nine indicators, including impact on four practice indicators for which target values were not set or expected, and we almost achieved the target value on four additional indicators.

Ms. Kemprecos concluded that because the work involved in this project was heavily research-driven, it yielded successful, cost-effective results. Audience research generated and validated messages, research findings were incorporated in message design, and research measured impact.

Recommendations

Ms. Kemprecos recommended that:

- Audience research be more focused than broad-based, and focused on message design. To do this, questionnaires need to include a large number of potential messages. The research report should recommend a list of specific messages. The benefit of doing this is that you are able to select a cost-effective message for your audience.
- Research-based messages be incorporated in communications, so that the impact of those messages can be quantified. To do this, the research report needs to be written for program planners first, and researchers second.
- Projects allow time and money to repeat the baseline survey, so that their accomplishments can be measured and so planners have input into the future direction of their work.

Comments/Questions

According to Ms. Middlestadt, research can help produce dialogue where there was no dialogue before, through increased communication among people and increased participation.

How much do you use research to change behavior? One way is to use research as an education tool. It is important to get government officers out of their buildings, expose them to the problems and make them build personal connections.

ENVIRONMENTAL INTERPRETATION IN CENTRAL AMERICA - A NEW MODEL FOR TRAINING

Presenters:

Rick Bossi, Latin America Coordinator, GreenCOM, AED
Jerry Bauer, Environmental Officer, USAID/Panama

José Ignacio Mata, Chief of Party, GreenCOM/Panama

The primary question of this discussion session was to learn from the presenters how they got trainees to go back and implement what they had learned, in each of the projects they had been involved with.

José Ignacio Mata, Chief of Party, GreenCOM/Panama

Mr. Mata commented on his experience in El Salvador. He indicated that to train people you have to give them real-life, meaningful experiences. In the particular case of El Salvador, GreenCOM brought people to the U.S. to visit a park and let them experience what it meant to be a park visitor guided by a park ranger. This experience had a positive impact on the Salvadorans and resulted in a change in their attitudes. Their original role as policemen, enforcing park rules and protecting park resources, was transformed to a new role as guides, engaging the people who visit their parks.

Mr. Mata added that it is very important, during the selection of the people to be trained, to ensure that these are the people that actually work in the field.

Jerry Bauer, Environmental Officer, USAID/Panama

Mr. Bauer commented on the experience he had had in Panama. A former poacher was hired to be the guide at a bird-viewing site. After being trained, his self-confidence increased and he saw himself as THE guide.

Mr. Bauer concluded by saying that that the differences in results between projects has to do a lot with the capacities of the people involved, their levels of experience and knowledge.

Rick Bossi, Latin America Coordinator, GreenCOM, AED

Mr. Bossi spoke from his experience in Nicaragua. He explained that, for that project, GreenCOM brought the best-trained people from El Salvador to Nicaragua. This produced a sense of competition that stimulated the park guides in Nicaragua to develop their own interpretation of the park. In addition, the training model itself requires participants to put what they have learned immediately to use. That is, training does not take place in a contextual or professional vacuum. Good training brings real-life problems into workshops in order to identify and apply appropriate solutions.

Results/Outcomes:

- Need to establish a professional association of environmental interpreters
- The guards developed a sense of pride in their work. This reflects a big change of attitude.
- The guards have become the experts. Visitors rely on them for accurate information.
- How does this training accomplish USAID objectives?
 - As these people become trained, they are the ones carrying the message.
 - Increased cooperation with NGO's
 - Increased knowledge on how to collaborate with USAID on mutual environmental goals

THIRD SESSION
WHAT HAPPENED AFTER GREENCOM LEFT

SUSTAINABILITY MODELS

Jordan

Presenter: Brian A. Day

Mr. Day opened this session on sustainability by discussing the GreenCOM project to develop environmental curriculum materials for eco-clubs in Jordan. Working with a highly esteemed Jordanian NGO –the Royal Society for the Conservation of Nature (RSCN) – the project introduced interactive teaching methods into the curriculum, a very new concept in Jordan. Development of the materials essentially was carried out by the RSCN, and by project end, the RSCN was fully committed and able to develop and produce innovative, interactive environmental materials on their own.

El Salvador

Presenter: José Ignacio Mata

Of all the projects Mr. Mata has undertaken in environmental communication, he said that probably the single most sustainable activity was the development and placement of environmental inserts for children into *El Diario de Hoy*, a major daily newspaper in El Salvador. The highly competitive and political environment between the two daily newspapers in El Salvador (*La Prensa* and *El Diario de Hoy*) ensured that this privately funded activity would engender and sustain interest in environmental issues. As a result of the inserts, schools became interested in providing students with materials regarding both local and global environmental issues. Annual contests in the paper invited children to write on environmental issues. The winners received prizes such as bicycles, computers and trips. By 1997, participation in the contests had increased from 2,000 to 129,000. The environmental contest continued after GreenCOM ended its presence in El Salvador.

Egypt II/III

Presenter: Brian A. Day

Mr. Day outlined three major sustainability achievements OF GreenCOM's two Water-Related Activities in Egypt. The first was building the capacity of the Water Communications Unit (WCU) within the Ministry to create environmental campaigns and newsletters and to train students in desktop publishing in order to continue the work once the project was completed. The second activity was the creation of the Water Users Association by the Minister to bring together diverse water interests to share ideas and strategies for good water management. The third enduring GreenCOM accomplishment was in the Ministry's new capability for developing and launching an EE&C campaign.

The Gambia

Presenter: Irma Allen

The relationships that the project teams were able to forge with stakeholders determined the degree to which they could excite them about environmental issues and encourage them to actively participate. GreenCOM created an awards program with \$10,000 in funding for prizes. Five years after the project ended this awards program has continued with the help of the Environmental Ministry. An environmental education strategy that was implemented by three

committees, with various donor support, led to creation of an Environmental Studies course at the University. Ms. Allen edited a handbook that is being used by the students in this course. She stressed that the support of the team's work by the home office was a critical factor in the success of the project.

Nicaragua

Presenter: Rick Bossi

This project created a series of commemorative postage stamps depicting the diverse natural resources of Nicaragua. Local response to the stamps (one of surprise that these were pictures of their own country!) enabled the local Environmental NGO to raise funds needed to continue environmental education work.

Nepal

Presenter: Brian A. Day

This project assisted in the development of e-mail and increased Nepal's connection to other environmental organization, NGOs and donors. At the community level, the participation of community members in the production of the video letters permitted: a) involvement of lower-caste members and women in a communal decision-making process, partially breaking established hierarchical roles; b) an improved understanding of several aspects of the policy initiatives governing the operation of Community Forestry User Groups; c) a description of the limitations of enforcing policy at the local level; and d) the development of personal communication skills among community members.

Zambia

Presenter: Irma Allen

This was a \$30,000 project to create messages in comic-book form regarding identification of hazardous materials in Zambian homes. Because comic books are easy and cheap to produce, Zambia has continued to produce and disseminate information on the environment using this medium.

Moderated Discussion

Participants:

Tony Meyer, Project Officer, Human Capacity Development Center/USAID

Lynne Hale, Director of the Coastal Resources Center, University of Rhode Island

Tiahoga Ruge, Director of the North American Center for Environmental Information and Communication (CICEANA), Mexico City

Bill Smith, Executive Vice President, AED

Jerry Bauer, USAID/Panama

Richard Grieser, Former Resident Advisor, GreenCOM/Mali

Isabel Castillo, Environmental Educator previously affiliated with NAAEE and CICEANA

Miguel Araujo, Former Minister of the Environment and Natural Resources, El Salvador

WHAT ARE THE CRITICAL ELEMENTS FOR SUSTAINABILITY? HOW DO WE DESIGN FOR SUSTAINABILITY?

The use of “self interest” approaches (such as contests, prizes, competitiveness among the private sector) would seem to be a very successful way to lay the groundwork for more “mechanistic” approaches that deal with government ministries, budgets, policy, etc. Involving stakeholders at the most basic level of the technical assistance allows for continuation of the activities once GreenCOM’s role in-country is over. Important questions to ask in terms of sustainability are:

- Do the communities see direct benefits from the interventions and are they experiencing a better standard of living as a result of the interventions?
- Have communities increased their access to resources through local governments?
- Do ministries enjoy political benefits?
- What elements should EE&C interventions have to ensure activities will survive once the external funding stage is over?

GreenCOM must continue to look into non-traditional places where sustainability may be created; to find creative pockets in the society, or as Bill Smith put it, “Not creating creativity, but finding it and using it.”

Other important factors for sustainability are the length of the project (longer is better, as in El Salvador and Egypt) and identifying people in-country who are willing and capable of continuing the work. It was suggested the AID should have a greater investment in fostering leadership roles among stakeholders, including using more regional professionals, especially because of the perceived “insularity” of Washington, D.C., with respect to the developing world. The projects should “not only teach but learn.” Donors should value the first-hand experience of the people in the field and allow for a two-way flow of ideas.

In conjunction with the idea of longer projects, donors need to think about environmental issues in global terms by identifying major issues and then targeting countries for application. Miguel Araujo suggested that GreenCOM establish a creativity award for local response to global topics. GreenCOM is known in the countries in which it has worked, but needs to expand its presence throughout the world. In this way, it could help create a broad guideline for “what does and doesn’t work.”

SUMMARY OF FINAL RECOMMENDATIONS MADE BY TAG MEMBERS

What follows is a summary of the major recommendations made by TAG members at the end of the meeting.

Leadership and Funding

- Prevent GreenCOM's vision and capacity from dissipating; maintain strong EE&C presence in USAID program strategies and funding.
- Develop sustainable funding strategies for EE&C involving both the public and private sectors.

Support and Sustainability

- Translate the best science into communication campaigns to build constituencies and public policy (e.g., global warming).

- Build alliances with counterparts that support essential project/program ideas over time.
- Build alliances with the private business sector (e.g., "green" industries) to expand EE&C programs and impact.
- Educate policy-makers and donors regarding the value of EE&C in creating synergy across sectors and programs.
- Create cross-institutional teams for EE&C research and development.
- Strengthen EE&C networks and associations among countries and projects; develop stronger ties with NAAEE and NAI.
- Foster leadership roles among stakeholders.
- Build professional associations among EE&C practitioners in developing nations and regions
- Use EE&C to build partnerships across constituencies and institutions.
- Create a program of small grants for strengthening NGO capacities in EE&C.
- Consider endowments that may allow institutions to implement projects over the long run.
- Plan gradual pull-out of countries avoiding sudden termination of interventions.

Models and Research

- Continue building environmental behavior-change models drawing from lessons in other sectors such as health.
- Develop protocols and methodologies for cross-regional learning in EE&C.
- Provide global guidance for an EE&C research agenda; the 3-4 most important questions can be nested in field programs across geographic regions.
- Explore the extent to which engaging different sectors of society into discussions about environmental protection leads to environmental-protection actions.
- Monitor interventions more frequently with smaller samples to complement impact evaluations that use pre-post designs and large surveys.

Program Implementation

- Use self-interest approaches (e.g., contests, prizes, competitiveness among private sector entities, etc.) to lay the groundwork for more "mechanistic" approaches affecting policy.
- Develop EE&C strategies, methods and tools to promote better environmental governance.
- Expand EE&C capacity through new information technologies; disseminate best EE&C models through web-based networks.
- Strengthen the role of EE&C in supporting international environmental conventions and treaties (e.g., Kyoto Protocol, Dublin Resolution).
- Build regional coalitions for EE&C around primary themes such as: protected areas and eco-tourism in Central America; water conservation in Middle East; trans-boundary water management in Southern Africa; marine-resources protection in the Caribbean; etc.
- Target specific issues in given countries, address them in depth and draw lessons for dealing with similar issues in other parts of the world.
- Create a global and/or regional "GreenCOM Environmental Award Scheme" for EE&C excellence.
- Maintain a consistent, dedicated core team for global leadership in EE&C.

Annex A
MEETING AGENDA

**Environmental Education and Communication (GreenCOM) Project
5th Technical Advisory Group (TAG) Meeting
January 13 & 14, 2000
Agenda**

**Morning Session Thursday:
Lessons And Successes
Moderator: Brian A. Day**

THURSDAY, January 13, 2000

8:30 Registration and Coffee Service

9:00 Welcome

- **Stephen F. Moseley**, President and Chief Executive Officer, AED
- **David Hales**, Deputy Assistant Administrator, Center for the Environment, USAID
- **Emily Vargas-Baron**, Deputy Assistant Administrator, Center for Human Capacity Development, USAID

9:30 Purpose of this TAG Meeting

- **Michael Philley**, GreenCOM Technical Officer, USAID
- **Anthony Meyer**, Project Officer, Center for Human Capacity Development, USAID

10:00 TAG Introduction

10:15 How Has GreenCOM Been Effective: Mission and Counterpart Comments

- **Lars Klassen**, Mission Director, Panama, USAID
- **Miguel Araujo**, Former Minister of Environment, El Salvador

10:45 Break

11:00 GreenCOM Overview of Achievements

- **Brian A. Day**, GreenCOM Project Director, AED

Charge to the TAG

- **Susan E. Middlestadt**, Senior Vice President, Center for Applied Behavioral and Evaluation Research, AED

11:30 Putting Environment on the National Agenda: Does Heating Up Work?

A Panel of Success

- Environmental Awards Schemes, **Irma Allen**
- National Encounters, **José Ignacio Mata**
- Video Letters, **Peter Spain, Irma Allen**
- Postage Stamps, **Rick Bossi**

12:30 Lunch

**Afternoon Session Thursday:
How Research Can Improve Programs
Moderator: Susan E. Middlestadt**

- 1:30 **Research and Communication: Essential Partners for Success**
 José Ignacio Mata, Vice President, AED; Former Chief of Party, GreenCOM/EI
 Salvador, Current Chief of Party, GreenCOM/Panama
- 2:00 **Infusion Can Improve Environmental Knowledge and Attitudes- When Done Well**
Evaluating Elementary School Curricula in Mali
 Orlando Hernández, Applied Research Director, GreenCOM, AED
- 2:30 **Egyptian Farmers and Water Conservation: Making Research Pay Off in**
Communication
 Louise Kemprecos, Research Consultant, GreenCOM/Egypt
- 3:00 **Break**
- 3:15 **The Role of Research in Achieving Effective Programs**
Moderated Discussion, **Susan E. Middlestadt**
- 4:15 **Environmental Interpretation in Central America - A New Model for Training**
- **Rick Bossi**, Latin America Coordinator, GreenCOM, AED
 - **Jerry Bauer**, Environmental Officer, USAID/Panama
 - **José Ignacio Mata**, Chief of Party, GreenCOM/Panama
- 5:00-6:30 **Reception**

**Morning Session Friday:
Sustainability
Moderator: Peter L. Spain**

FRIDAY, January 14, 2000

8:30 **Coffee Service**

9:00 **Welcome Back**

- **Brian A. Day**, GreenCOM Project Director

9:15 **What Happened After GreenCOM Left: Sustainability?**

Models from:

- The Gambia, **Irma Allen**
- El Salvador, **José Ignacio Mata**
- Egypt II/III, **Brian A. Day**

Moderated Discussion, **Brian A. Day**

10:15 **Break**

10:30 **Input from TAG members:**

What are GreenCOM's Most Important Lessons & Successes?

What is Needed from USAID for Future Environment Education and Communication?

11:45 **Closing Remarks**

12:00 **Adjournment**

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Annex C
TAG MEMBER BIOGRAPHIES

**2000 GreenCOM TAG Meeting
TAG Member Biographies**

MIGUEL ARAUJO

Mr. Araujo was until May 1999 the first Minister of the Environment and Natural Resources of El Salvador. He is the former President of the Central American Commission on Environment and Development (CCAD in Spanish). He promoted the Mesoamerican Biological Corridor (MBC) and signed a memorandum of Understanding with the NASA Administrator, on behalf of the CCAD, in support of the MBC. He negotiated the Project on Coffee and Biodiversity for El Salvador, which became the first GEF-supported grant for agriculture and biodiversity. He also promoted what has been considered as one of the best multimedia CD-ROMs on Environmental Management in the world. This CD-ROM which contains international, regional and bilateral environmental agreements; digitalized versions of El Salvador's environmental education material (teachers' guidelines, educational videos, etc...) and the mapping of the entire Salvadoran shoreline with environmental sensitivity indices and a GIS system. Before becoming a Minister, Mr. Araujo produced the book he directed the book "The Salvadoran Challenge: From Peace to Sustainable Development", that was published in May 1997. He organized in 1991 the Executive Secretariat of the Environment of El Salvador, and managed it through 1994, period during which he negotiated debt for nature swaps with the United States and Canada. He has a Master of Arts in Economics and a Master of Science in Public Administration, both from the State University of New York at Stony Brook.

WALTER ARENSBERG

For the past six years, Mr. Arensberg has served as the deputy director of the World Resources Institute's (WRI) Center for International Development and Environment. In this role, he oversees the USAID-funded Environmental Planning and Management Project, which provides technical support services in strategic planning for resources management, environmental monitoring, and information systems, and training for community organizations throughout Africa, Asia, Central and South America, and the Caribbean. Prior to joining WRI, Mr. Arensberg was a consultant to the International Institute for Environment and Development, where he evaluated various programs implemented by non-governmental organizations (NGOs). He also was a general partner in the urban planning firm of Skidmore, Owings, & Merrill for 14 years, where he managed domestic and international land use, transportation and urban redevelopment and , as well as conducted environmental impact assessments and policy analysis. From 1966 to 1968, Mr. Arensberg served as evaluation officer for the U.S. Peace Corps. Mr. Arensberg has a M.A. in city planning from Harvard University.

JOHN BALDWIN

Dr. Baldwin is an accomplished environmental scientist and educator. Currently, he is head of the Institute for a Sustainable Environment, at the University of Oregon. In 1993, he served as president of the North American Association for Environmental Education (NAAEE), the largest professional organization of its kind in the world. He has extensive domestic and international experience on a range of environmental issues, but is especially well recognized for his work on the effects of pollution on humans. For NAAEE, he is working with colleagues in Kiev, Ukraine to establish an environmental education center in that city. Dr. Baldwin was also the principal investigator of a project entitled "Chernobyl: Applied Information for Education and Decision-Making" and continues to serve as a visiting associate professor of the environmental science program at the International University in Moscow. He has a Ph.D. in Zoology and Wildlife Ecology from the University of Wisconsin.

JUDY BRAUS

A leading environmental educator in the U.S. and internationally, Ms. Braus is currently the director of environmental education for the World Wildlife Fund (WWF). Supported by a \$2.5 million grant from Eastman Kodak, she is developing and implementing a national biodiversity environmental education program for the U.S. Prior to joining WWF, she spent two years as Program Manager for Environmental Education with the U.S. Peace Corps where she: helped develop long-term objectives and plans for new environmental initiatives in several countries; developed model workshops to link environmental education with English and science teaching; and designed an agency-wide strategy for incorporating environmental content into pre-service training for all Peace Corps volunteers. From 1987 to 1991, she served as the National Wildlife Federation's director of environmental education, and also was senior editor of the children's magazine, *Ranger Rick*. Ms. Braus is co-author of *Environmental Education: Creating a Program That Works!*, a 200-page book for national and international audiences. She has a B.S. in environmental science from the University of Maryland.

MARTIN FISHBEIN

Dr. Fishbein is a preeminent behavioral scientist and creator of the *Theory of Reasoned Action*. At present, he is professor of psychology and research professor at the Institute of Communications Research, University of Illinois. He is also a consultant to the National Institute of Mental Health's AIDS Research Program and serves on several NIMH advisory committees. Dr. Fishbein has been honored by the American Marketing Association for his contributions to marketing research. He holds a B.A. degree in psychology and economics from Reed College and a Ph.D. degree in psychology from the University of California, Los Angeles.

LYNNE HALE

Ms. Hale is associate director of the Coastal Resources Center (CRC) at the University of Rhode Island (URI), an organization dedicated to developing strategies for the effective management of coastal environments in the U.S. and worldwide. She is a specialist in the design and management of coastal ecosystem management programs with more than 20 years of domestic and international experience in public education, participation, training, and outreach activities. Concurrently, she is assistant director of the USAID-funded Coastal Resource Management Project, a ten year cooperative program with major pilot programs in Ecuador, Sri Lanka, and Thailand. Since 1977, she has worked intermittently on coastal and marine-resource issues that impact native Alaskan communities. In addition to her position with CRC, she is an adjunct assistant professor in URI's Department of Marine Affairs. Ms. Hale has a M.S. in biological oceanography from the University of Rhode Island.

ROBERT HORNİK

Dr. Hornik is an expert in development communications, evaluation design, and analysis. He is professor of communications at the Annenberg School of Communications and director of the Center for International Health and Development Communication. His research has been instrumental in helping program and field practitioners develop a better understanding about the factors that influence people to change their health and nutrition behaviors. Dr. Hornik has served as principal investigator or co-principal investigator on five A.I.D.-funded research projects, including HEALTHCOM and AIDSCOM evaluation subcontracts, and has participated in several prestigious committees, including the National Academy of Sciences' Committee on International Nutrition Programs and the WHO/Global Program on AIDS Steering Committees on Behavioral Research and Evaluation. Among his numerous publications on development communication is *Development Communication: Information, Agriculture, and Nutrition in the Third World*. He has a Ph.D. in communication research from Stanford University.

MAGNUS K. NGOILE

Dr. Magnus K. Ngoile is the Director General of the National Environment Management Council of Tanzania. Dr. Ngoile specializes in national and regional processes to establish integrated coastal management. He was director of the Institute of Marine Sciences of the University of Dar es Salaam for ten years and then served as coordinator of IUCN's global Marine and Coastal Program until his recent appointment as director general of NEMC. Holding a Ph.D. from the University of Aberdeen in Scotland, Dr. Ngoile has been a leader in the enactment of national legislation allowing the creation of community-based marine parks and reserves in Tanzania. He has also led an IUCN-sponsored effort in Tanzania that identified potential areas for marine reserves, work that led to the creation of the first marine reserve in the country in 1995, the Mafia Island Marine Park. In July 1999, he was one of ten winners worldwide of a PEW Marine Conservation Fellowship; PEW cited him as "Tanzania's top environmental official who will build capacity of poor villagers to protect their coastline." With his PEW Fellowship, Dr. Ngoile

intends to build the capacity of poor coastal communities in the Kilwa District of Tanzania to control their own marine resources and adopt integrated coastal management practices that support sustainable fisheries and offer both local and regional economic benefits.

PAUL NOWAK

Paul Nowak has been associated with the School of Natural Resources and the Environment at the University of Michigan for more than two decades. Among his responsibilities, he has been Director of the National Consortium for Environmental Education and Training; Director of Professional Education; and Director of the Wildland Management Center. He serves as a member of the Education Committee of the President's Council for Sustainable Development and on the Global Rivers Environmental Education Advisory Committee. Dr. Nowak also spent five years teaching in the College of Education at Southern Illinois University from 1969 through 1974, and was a science teacher in two Detroit public elementary schools. He has written books, articles, and training materials on solid and hazardous waste, watershed management, and environmental journalism. Dr. Nowak has his B.S. and M.S. degrees from Wayne State University and his Ph.D. in Natural Resources from the University of Michigan.

TIAHOGA RUGE

Ms. Ruge has extensive international experience in promoting the environment through television, films, and other communication vehicles. She is currently director of the North American Center for Environmental Information and Communication, headquartered in Mexico. She has produced and directed films and documentaries on social and environmental issues, including a five-part series on the Biosphere 2 project. She was Science and Culture Counselor for the Embassy in Mexico in India from 1984 through 1988. From 1988 through 1991, back in Mexico, she designed and directed the "Mass Media and Environment: A National Call for Environmental Awareness" project. In 1991, Ms. Ruge received the UNEP Global 500 Roll of Honor award. Ms. Ruge has an M.S. degree in biology from the University of Houston and an M.A. in film direction from Cinecitta in Rome, Italy, where she also worked as an assistant to the film director Federico Fellini.