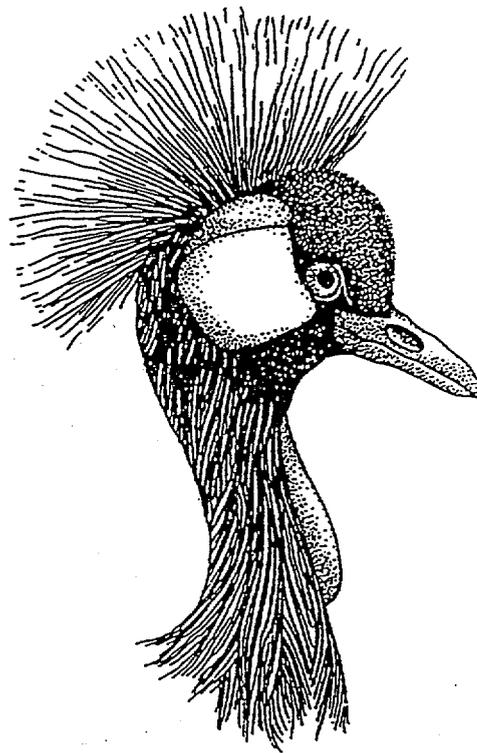
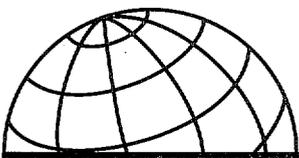

**Action Program for the Environment Uganda Project
(617-0124)**

**Guidelines for Effectively Incorporating
Environmental Education into Natural Resource
Management at the District Level in Uganda**



Submitted to
United States Agency for International Development Uganda
Contract No. 623-0124-C-00-2049-00

Submitted by
Tropical Research & Development, Inc.
Gainesville, Florida, U.S.A.



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Prepared by

David Wood
Tropical Research and Development, Inc.

Submitted to

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Acronyms

IUCN International Union for the Conservation of Nature
NEAP National Environmental Action Plan
NEMA National Environmental Management Authority

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Overview

The purpose of this Tropical Research and Development, Inc. (TR&D) contract is to facilitate USAID's three-year program of assistance to the government of Uganda, which is promoting the effective and sustainable management of Uganda's natural resources. The program emphasizes environmental and natural resource planning, training for institutions managing natural resources, and support for organizations whose work fosters rational, long-term use of natural resources. A TR&D team supports the policy, resources rehabilitation, and conservation components of the program.

The National Environmental Action Plan (NEAP) includes revised environmental policy to support legislation, improved institutional mechanisms for environmental management, and greater grassroots participation. TR&D provides a technical advisor and a community conservation advisor to the NEAP Secretariat and the Ministry of Natural Resources to assist in developing and implementing the National Environmental Action Plan (NEAP).

1. Introduction

The purpose of the contract component outlined in this report was to assist in preparing environmental education guidelines for the National Environmental Action Plan (NEAP). At the national level, the NEAP calls for the establishment of a National Environmental Management Authority (NEMA) that will guide the development and implementation of national environmental policy. At the district level, it calls for the assignment of district environmental officers to implement and coordinate programs to address environmental issues confronting each of Uganda's districts. Both of these offices are expected to play major roles in coordinating and implementing environmental education programs.

The task was to delineate how the National Environmental Management Authority (NEMA) and the district environmental officers can work together to design and carry out education programs that, by producing positive environmental impacts, will result in the maximum benefit for Uganda's citizens. The basic premise underlying these guidelines is that the ultimate goal of environmental education is behavioral change. The development of awareness, knowledge, and attitudes is the means to achieve this goal, not the end in itself.

For environmental education programs to be effective in producing meaningful behavioral change and, therefore, environmental impact, they must be carefully planned. Their target audiences, content, and delivery must all be appropriate to the environmental problems they focus on, as well as the social, political, and cultural characteristics of the communities in which the programs are presented. These guidelines are designed to help NEMA staff and the district environmental officers, among others, plan, develop, and inspire such environmental education programs.

The work for this contract component was completed between 12 July and 14 August, 1995. The objectives were accomplished through review of available documents and literature and through discussions with a range of individuals in Kampala, Kasese District, and Mbale District. Drafts of the guidelines were discussed in fora with local government officials in Mbale and with national officials in Kampala.

1.1. Some impressions regarding environmental education in Uganda

1.1.1. Environmental education applied to environmental issues in Uganda

During the course of this work, several environmental issues in Uganda came to light, including:

- 1) *Soil erosion on steep slopes in Kasese and Mbale districts.*—In these areas, one can easily see numerous fields with furrows heading up and down the hills, on slopes so steep that one marvels anyone can even climb them, let alone farm them.
- 2) *Encroachment into the Forest Reserve in Tororo District in defiance of Forest Department policy.*—Large areas in the reserve have been cut, and there are several

stations in the reserve where people had been processing reserve timber for charcoal production.

- 3) *Encroachment into Queen Elizabeth National Park.*—Here, residents of villages in and around the park illegally kill wildlife, collect firewood, and clear native vegetation for agriculture.

Apparently, the main obstacle environmental education must address, if it is to resolve these issues, is the lack of viable alternatives for the affected people. From their perspective, it does not appear to be in their own best interests to change the behaviors producing these problems.

For example, in Tororo District, the Forest Reserve prohibits any use of the reserve's resources by adjoining communities. Likewise, in Queen Elizabeth National Park, residents are not allowed to cut firewood, clear land for agriculture, or harvest wildlife. Moreover, residents in and around the park benefit minimally from tourism. Thus, the only way that local people can benefit from the reserve and park, for even reasons of basic subsistence, is by violating Forest Department and National Parks Department policies.

Unless affected communities can be shown that these policies are indeed in their best interests, the gains from "environmental education" would be negligible. The first step, then, is to develop new policies that will protect the park's and reserve's resources over the long term, while at the same time allowing local people to benefit from living near these areas. For instance, the adjoining communities might be allowed to harvest some products from the areas in return for following certain regulations necessary to safeguard other key resources. In addition, every means to share the benefits of tourism with these communities should be explored. Ideally, park officials and local residents would work closely together to develop new policies. Only then will environmental education produce the desired effect of helping to ensure that park and reserve resources are managed properly.

At Mt. Elgon National Park, the International Union for the Conservation of Nature (IUCN) and the National Parks Department are now working closely with adjacent communities to develop policies that protect park resources and serve community needs. The observations and results of and lessons learned from this effort will be invaluable to other Uganda parks and forest reserves.

The control of soil erosion is more problematic. Short-term survival requirements obscure the need for measures that would result in long-term sustainability. Therefore, small-scale, subsistence farmers generally do not employ known or introduced erosion control techniques.

Discussions with Henk Hoefsloot, the IUCN technical advisor to the Mt. Elgon Management Project, explicated this situation further. According to Mr. Hoefsloot, soil conservation measures are frequently applied in profitable cash crop fields, such as coffee

and tea. In these cases, enough money is made to justify the time and expense required to implement such measures. But in subsistence plots, conservation measures are usually not thought to be worth the effort. In Mr. Hoefsloot's experience, as a soil management specialist with experience in several African countries, the key to convincing subsistence or low-income farmers to implement soil conservation measures is to advocate measures that provide benefits additional to erosion control. In Chad, he was successful in encouraging farmers to build terraces with rocks because these retained rainwater in addition to holding soil in place. In Mbale, farmers build terraces using napier grass, which can be harvested as feed for cows under zero grazing regimens. Now farmers are planting eucalyptus on their plots because they can sell poles for transmission lines.

Soil erosion control measures are time consuming and take much precious land out of production, therefore, the benefits must outweigh the expenditures. Before designing environmental education programs to address soil conservation, these issues must be carefully studied and addressed. Without practical alternatives for farmers (developed in collaboration with the farmers themselves), environmental educators will stand little chance of affecting farmer behavior.

From information gathered in Uganda and in other countries then, it is safe to conclude that the main cause of environmental degradation is the lack of viable alternatives to destructive behavior. Environmental educators, on the other hand, often seem to attribute environmentally destructive behavior to a lack of "environmental awareness." However, farmers and others often know a problem exists—they either do not know what to do about it or cannot afford the implementation costs or immediate consequences. "Awareness" efforts are necessary and effective only if people are actually unaware. Making this determination requires that educators become acquainted with target audiences before trying to "educate" them.

1.1.2. School programs

Regarding school programs, one prevalent impression is that teachers in Uganda, especially in rural areas, rely primarily on "chalk talk" methods of teaching—that is, lecturing pupils who take notes. This is the case in most countries, particularly in rural areas where teachers are often minimally trained (in Kasese District, for example, a teacher shortage has compelled the district to hire uncertified teachers). Effective environmental education, on the other hand, often calls for more progressive techniques, such as discovery or cooperative learning.

Thus, implementing effective environmental education programs in the school system will require extensive teacher training—more than can be accomplished in a two- or three-day in-service workshop. In-depth training programs, such as month-long seminars or courses in the Teachers Training Colleges, may be required. Teachers need to be well versed in how to bring about meaningful learning and how to develop critical and creative thinking skills, before being trained in environmental education content and techniques.

Affecting school-based environmental education program development as well are the standardized national exams given to students at the end of primary year seven and secondary year four. Student scores from these exams are heavily weighted in assessments of teachers, schools, and districts. Therefore, teachers are reasonably reluctant to spend time and effort on programs not evaluated by national exams. Thus, it may be essential to include environmental education program criteria in the standardized exams.

1.1.3. Training needs

Environmental education programs are rarely designed using a systematic planning process, such as the one described in these guidelines. Thus, it should be assumed that NEMA staff members and the district environmental officers, among others, will require relevant training. An effective planning-process workshop curriculum would take the following points into account:

- A. Participants first need to agree that the ultimate goal of environmental education is behavioral change, not attitude and awareness development. On occasion, this takes some time to discuss, because environmental education is so often expressed as awareness development. Unless workshop participants agree to this at the outset, they will not fully appreciate the need for systematic environmental education planning.
- B. Then, the environmental education process, described in the guidelines, and the reasons it is necessary need to be presented to the participants. In small groups, they may work together to apply the process to selected case studies and to share their conclusions. This may take one to two days.
- C. Next, the participants might be briefed on the environmental issues confronting Uganda or selected regions and communities, if they are not already familiar with them. At some point, they will need to know something about their local environmental issues, or at least where they can obtain information about them.
- D. If participants are familiar with at least some environmental problems in the regions where they work, they can begin developing environmental education plans. After each step in the process, they can report their conclusions and critique each other's work. In this way, they can develop a facility for using the planning process and can refine their work plans.
- E. Now participants can be trained in specific education strategies, because they will have an idea which strategies they will be using.
- F. Environmental educators sometimes come to the United States to look at various environmental education strategies in action. Should this opportunity become available to Ugandan educators, I recommend that they not avail themselves of it until environmental education plans have been developed and approved. There are two reasons for this delay: first, without carefully developed plans, educators often adopt

strategies simply because they strike their fancy, without first considering which strategies would have the most environmental impact; second, it may be wise to see some evidence of personal initiative and commitment to implementing environmental education programs before investing in the training trip.

- G. Once programs are under way, periodic meetings of educators—in which they present progress reports and share ideas and experiences—can effectively encourage and motivate educators to follow through with education plans.

1.2. Organization of the report

Section 2 defines environmental education and describes how to plan programs that produce significant environmental impact.

Section 3 describes how district environmental officers and others working at the local level can plan, coordinate, implement, support, and evaluate effective environmental education programs. This section addresses primarily those working at the district level.

Section 4 describes how NEMA staff and the district environmental officers can partition the work of implementing environmental education programs in Uganda. This section addresses primarily people working at the national level to set and implement national environmental policy. It became clear in preparing these guidelines that they are to be used by two distinct audiences—one at the national level and the other at the local level.

Appendix A assesses, in table form, various frequently employed environmental education strategies. These tables discuss when each strategy is appropriate and outline the relative target audiences, strengths, and weaknesses of each.

Appendix B discusses the factors to consider when implementing environmental education programs in Ugandan schools.

Appendices C and D contain a list of people contacted and a bibliography, respectively.

2. Planning environmental education programs

2.1. Introduction

Environmental education is defined by purpose rather than discipline. Essentially, it is any type of education that attempts to enable and motivate people to use their environment wisely, so that it can continue to provide for the wants and needs of people and other living things. UNESCO, in the Tblisi Conference on Environmental Education in 1977, produced the following definition:

Environmental Education is a process aimed at developing a world population that is aware of, and concerned about, the total environment and its associated problems, and which has the knowledge, attitudes, skills, motivation, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones.

Specifically, environmental education strives to achieve this goal by improving people's awareness and knowledge of environmental problems, their attitudes toward the environment, and their skills in resolving existing problems and avoiding future ones. It can be applied in a wide variety of formal and informal situations and can present a wide array of subject matter. It is important to note that the ultimate purpose of environmental education is to change behavior. Environmental education can only be considered successful if it eventually leads to improved environmental conditions. Awareness, knowledge, and attitudes are the means environmental education uses to achieve its ends—they are not the end in and of themselves.

There is certainly no shortage of material to present in environmental education programs. Subjects can range from ecology and other sciences to history and government, from home economics to farming techniques to practical natural resource conservation. Teaching anybody anything is worthwhile, but every educator is limited in time, energy, and resources. The challenge is to prioritize efforts to maximize positive environmental impact. Ultimately, environmental impact is the way to measure environmental education's contribution to improving people's welfare.

The majority of environmental education programs fall short of realizing their potential environmental significance. This happens even when teaching is sound and people learn. The main problem is that many, if not most, environmental education programs are tenuously related to the specific environmental problems they are supposed to help resolve. People learn facts and concepts, but environmentally important behavior does not change, and environmental conditions do not improve.

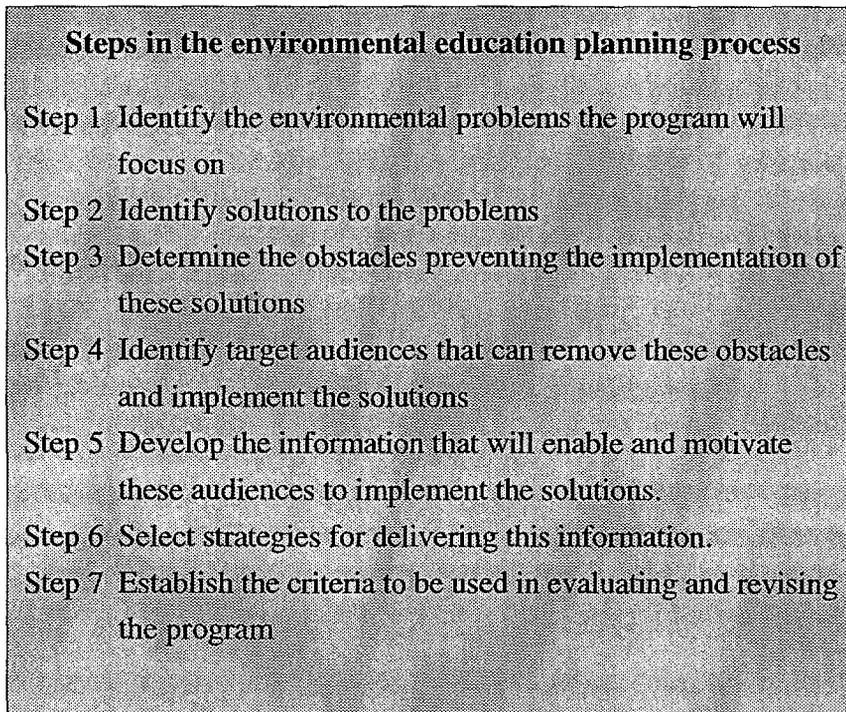
As a result, while many people involved with natural resource management maintain that environmental education is critical in general, in specific situations, environmental education programs are often the first to be reduced or eliminated when environmental

management efforts face shortages in money and personnel. The utility of many environmental education programs is simply not evident.

Environmental education programs must be carefully designed to bring about environmentally significant behavioral change. Their target audiences, content, delivery strategies, and criteria for evaluating success must all be carefully identified. To this end, the remainder of section 2 presents a planning process that, when applied, maximizes the likelihood of environmental education programs realizing their potential environmental impact.

2.2. The environmental education planning process

To plan an environmental education program, the program designers should follow the seven-step process described below.



2.2.1. Brief description of the process

Step 1 Identify significant environmental problems

Step 2 Identify solutions

Step 3 Determine the obstacles to implementing the solutions

First, it is critical to identify the environmental problems that the environmental education program will address. This is important even in school and other programs that are

ostensibly directed at general knowledge and awareness rather than at specific problems or behavioral change. Knowledge and awareness will not, by themselves, improve environmental conditions. Eventually, what will be important to society and the environment is what children do, not what they know. Benefit can only be derived if their environmental schooling is reflected in their actions. Consequently, even in school programs, educators should first determine how students will be contributing to sound environmental management. The schools should then work toward this end.

Indeed, children often do not have to become adults before helping to resolve environmental problems. They can plant trees, clean up litter, launch community awareness campaigns, and prepare exhibits and demonstrations. In addition, many already are working on family farms, or soon will be, and therefore are affecting soil, water, and other natural resources for good or ill.

Environmental educators should not spend their valuable time focusing on relatively

Criteria to use when selecting appropriate environmental problems

- 1) They should be significant
- 2) They should have feasible solutions

trivial issues or on issues that they have no reasonable hope of solving. To merit attention in an environmental education program, environmental problems should meet two criteria: they should be significant and they should have feasible solutions.

Implementing solutions and resolving any obstacles impeding their implementation are the ultimate goals of the environmental education program. If the solutions are implemented, the program can be considered a success. Thus, these solutions must be clearly identified at the beginning, because the program's content and delivery strategies will be directed toward bringing them about.

In identifying the education program's environmental problems and their solutions, the educator typically has a general idea of whose behavior will ultimately need to change. These people will have to be consulted frequently during the initial planning stages. The more closely that targeted problems coincide with the concerns of the people ultimately responsible for solving them, the more successful the education program will be in bringing about behavioral change. The solutions to the problems will have to be appropriate for the people who will be implementing them. Their needs and wants and the realities of their situations must be taken into account.

Thus, if farmers are to implement soil conservation measures, they should help develop them. Or if people are to be convinced to reduce illegal incursions into a forest reserve, they should help design policies that will make it in their interest to reduce such incursions. Without such input, the risk is great that unrealistic solutions will be advocated. The environmental educator, then, must work closely with the people who will ultimately implement the measures needed to solve targeted environmental problems.

As the planning process proceeds, however, additional target audiences may be identified. The educator should feel free to adjust the solutions advocated by the education program as he or she learns more about the situation.

Step 4 Identify the target audiences

Target audiences for environmental education programs need to meet two requirements: they must be able to contribute to resolving the environmental problems and they must find it in their interests to resolve them.

Education changes people's behavior through logic and common sense. It operates on the principle that people will usually do what they perceive will provide what they want and need. Conversely, they will not, as a rule, voluntarily do things contrary to their interests. Hence, it is of the utmost importance to involve them as much as possible in identifying the environmental problems and solutions the education program will address.

If it is not in the interest of a person to help resolve an environmental issue, that person should not be the direct target audience of an environmental education program. Teaching a farmer how to control soil erosion on his land can be effective because the farmer needs the soil in order to be successful. But trying to stop wildlife poachers by teaching them about the harm they are doing is probably a waste of time because poaching clearly serves the poachers' interests.

The poacher, however, can be the indirect focus of the education program. An education program can change his behavior by, for instance, convincing law

enforcement authorities to intensify efforts to stop the poacher's activities. Or it might show the poacher's community how the wildlife being poached benefits the community, perhaps because it attracts tourists who spend money in the community. With this information, the community itself will be motivated to stop the poaching. Ultimately then, an environmental education program might not end up targeting someone like a poacher who directly affects a natural resource, but rather someone else who can, in turn, affect him.

There are at least six potential target audiences for environmental education programs in Uganda:

- 1) people directly affecting a natural resource, such as farmers plowing fields or applying pesticides or villagers collecting firewood;

Target audience requirements

- 1) They need to be able to contribute to resolving the environmental problems
- 2) They need to find it in their interests to do so

- 2) local government leaders who can pass and implement laws and policies that influence how people treat the environment;
- 3) opinion leaders whose example and advice may be heeded, even though they may not hold influential government positions;
- 4) educators, such as teachers, extension workers, radio and television programmers, and journalists;
- 5) schoolchildren, for both short- and long-term environmental impact, as discussed above; and
- 6) the general public.

Potential target audiences	
1)	People directly affecting natural resources
2)	Local government leaders
3)	Opinion leaders
4)	Educators
5)	Schoolchildren
6)	The general public

An environmental education program might easily target more than one of these groups to resolve a single issue.

To work successfully with target groups, environmental educators need to know them well, for example, their beliefs, traditions, preferred methods of communication, taboos, and level of literacy should be understood. Only with

such knowledge can educators select the content of their programs and effectively deliver it.

Step 5 Determine the program content

Now the program's actual content can be decided upon. It is simply the information that will enable and motivate the target audiences to implement the solutions to the environmental problems pinpointed in step 1. The information to present in an education program will always exceed the available time. Thus, to use valuable time and resources as effectively as possible, the educator needs to present only the information that will cause the target audience to adopt environmentally sound behavior. To do this, the educator must know his or her audience. He or she needs to know whether the target audience:

- 1) is aware that the environmental problem exists;
- 2) understands its relationship to the problem—how the environmental problem affects it and how it creates or can address the problem;
- 3) knows how to implement the solution to the problem;
- 4) knows how the solution will benefit it.

With this knowledge, the educator will not waste time trying to create an awareness when it already exists or describing how to implement a solution when the target audience is not motivated to learn it.

Step 6 Select the education strategy

The strategy selected will be that which can best communicate the program's content to its target audience. Only now, therefore, can it be identified. Yet many, if not most, environmental education programs actually begin here and work backwards for justification. Such an approach cannot be expected to help resolve environmental problems because the approach has not been designed with specific problems and their solutions in mind.

Educators can choose from a wide range of strategies: school programs; extension services; newspaper articles; radio and television programs; exhibitions; special campaigns; community tours; traveling road shows; miscellaneous materials ranging from T-shirts to placemats to cereal boxes; posters, pamphlets, and other special publications; and one-on-one communication. These strategies differ in:

- 1) the types of information they can communicate,
- 2) the amounts of information they can communicate,
- 3) the target audiences they can communicate with, and
- 4) cost and practicality.

Extension programs, for example, can convey much practical information to farmers, women, and other groups, but can be expensive and labor intensive. Mass media, on the other hand, can communicate relatively inexpensively with large numbers of the "general public," but usually not in great depth. The environmental educator needs to consider carefully the program's message, target audience, and practical limitations before selecting a communication strategy.

Actually, in most cases, the environmental education program has already begun. It started when the educator sat down with the eventual target audiences to delineate the environmental problems and solutions on which the program would focus. This collaboration, using such techniques as rapid rural appraisal, can go a long way in developing people's awareness and knowledge of and commitment to resolving environmental issues.

Step 7 Establish the program evaluation

Having followed this process, the educator now has a way to measure the ultimate success of the environmental education program—Did it eventually lead to improved environmental management? Often, however, some time must elapse before the impact of

the program can be seen in the environment. In the interim, the educator can use other benchmarks to assess the program's effectiveness. The educator can ask:

- 1) Has the target audience learned the material? Has it learned the information, skills, and attitudes presented by the program? If not, it could be because the audience:
 - a) Has not encountered the message.
Solution: A different education strategy.
 - b) Has not understood the message.
Solutions: Revised teaching techniques (application of the educational strategy); time.
 - c) Has not believed the message.
Solutions: Revised teaching techniques; improved understanding of audience so that new material can be presented in a manner less dissonant with pre-existing ideas; time.
- 2) Has the target audience learned the program's information, but not changed its behavior? It could be because:
 - a) The audience is insufficiently concerned.
Solution: Increased emphasis on relating the environmental issue to the target audience's interests.
 - b) Social pressure exists.
Solutions: Time; attention spent on community members applying pressure.
 - c) The solutions being advocated are unrealistic or unsound.
Solution: Revised environmental solution.
 - d) The audience is nervous.
Solutions: Time; demonstrations of solution (many people are more comfortable with solutions they have seen used successfully); attention directed toward prestigious community members.
 - e) The solutions are too dissonant with traditions.
Solutions: Time; development of more realistic solutions; rephrasing of information so it conflicts less with prior beliefs.

- 3) Has the target audience implemented the measures advocated by the education program, but is no environmental improvement in sight? The problems could persist because:
- a) The measures take time to produce a noticeable environmental impact.
Solution: Time.
 - b) The measures do not affect environmental quality.
Solution: Revised environmental solution.
 - c) The people whose behavior has changed are not the ones affecting the environmental problem.
Solution: Attention directed toward a different target audience.

3. Implementing environmental education programs at the district level

3.1. Introduction

The National Environmental Action Plan Secretariat proposes that each district in Uganda have a district environmental officer. Broadly speaking, the role of this officer will be to “work with the district executive secretary to ensure the integration and incorporation of environmental concerns in all district development activities” (NEAP, “Draft Proposal” p.37).

Among the many responsibilities of the district environmental officer will be that of developing outreach education programs at the district and rural community levels (NEAP, “Decentralizing Natural Resource Management” pp.33–36). This individual will be expected to work closely with the entire range of private and government entities at the district level that have, or could have, environmental impact. These will include the district executive secretary, the district environmental committee, the district technical planning committee, local nongovernmental organizations, the general public, and the district’s forestry, agriculture, veterinary, education, and fisheries officers. This individual will also serve as the crucial link between the National Environmental Management Authority and the districts. Through the district environmental officer, national policies will be translated into local action and will, in turn, reflect local needs and characteristics.

The district environmental officers will also work closely with the local environmental committees at the municipal and subcounty levels. The National Environmental Action Plan Secretariat suggests that municipalities and subcounties appoint local environmental committees that will essentially perform the same functions as the district committees, but at the local level (NEAP, “Draft Proposal” p.38–39). It also suggests that some municipalities, at least, appoint a local environmental officer, with responsibilities similar to those of the district environmental officer (NEAP, “Decentralizing Natural Resource Management” p.13).

The challenge confronting the district environmental officers (and other district and local officers) will be to inspire an array of formal and informal environmental education efforts that reflect both national policies and priorities and local environmental, political, and social conditions. They will be able to encourage the development of such programs in both the public and private sectors.

3.2. Environmental education planning

The district environmental officers should have a district environmental education strategy. This strategy should identify:

- 1) The priority environmental problems confronting the district.

- 2) The solutions to these problems. These solutions should be general and broad; specific measures should only be developed during the planning of specific environmental education programs. For instance, a strategy might state that farmers should implement soil erosion control measures without specifying those measures.
- 3) The obstacles to implementing these solutions.
- 4) The people who can address these obstacles and bring about the solutions.
- 5) What these people have to do to implement the solutions.

Developing the district environmental education strategy in this fashion focuses environmental education, right from the start, on behavioral change rather than “awareness” development. It ties environmental education directly to the district’s environmental needs; thus, environmental education becomes a priority to implement. The district environmental officer now has criteria to use in deciding on which environmental education programs to concentrate the office’s efforts, resources, and money.

Resources available to the district environmental officers include the national “State of the Environment Report for Uganda” and “the National Environment Management Policy” (see bibliography). In addition, the NEMA Division of Education, Awareness, and Training may be in place by the time the district officers are preparing their education strategies; the role of this division would be to prepare a national environmental education strategy. Ideally, this document would provide guidelines that would help the district environmental officers identify district priorities, without being overly prescriptive and limiting. District environmental officers would, of course, be responsible for addressing national priorities at the district level. Yet they should be allowed the flexibility to select which priorities their office should address. They will know, better than NEMA staff, which environmental problems are particularly serious in their respective districts and also which problems they can confront most effectively.

Each district environmental education strategy will require the approval of the district environmental committee and the district resistance committee. The strategy should incorporate input from other offices and individuals who have environmental and social knowledge of the district and whose support of subsequent environmental education programs would be important. These might include the local environmental committees, the district technical planning committee, other district officers, environmental nongovernmental organizations, and knowledgeable and perceptive district residents.

3.3. Environmental education implementation

The district environmental officers can now take on the task of seeing the environmental education strategy implemented. For this to happen, environmental education programs must fit the priority needs identified in their strategies. The district environmental officers

may choose from several routes. They may:

- 1) actively seek out and try to collaborate with educators and institutions that they feel can best work with the target groups identified in the strategies;
- 2) consider supporting and collaborating with programs and proposals prepared by educators and institutions on their own; or
- 3) implement education programs themselves.

The options chosen will depend on which educators and organizations can best work with the identified priority target groups.

District environmental officer implementation options

- 1) Actively seek out and try to collaborate with educators and institutions
- 2) Consider collaborating with existing programs
- 3) Implement education programs themselves

The educators should:

- 1) be in contact with the groups;
- 2) be able to work effectively with the groups because they are trusted by them and because they understand the groups' needs, desires, beliefs, concerns, existing knowledge, degree of literacy, and other specific characteristics; and
- 3) be able to communicate the information that will capacitate and motivate the groups to adopt the environmentally sound behavior identified in the environmental education strategies.

3.3.1. Collaboration

Assuredly, the district environmental officers will identify, using the above criteria, individuals and organizations with which they will want to collaborate in implementing environmental education efforts. First, they will need to determine that the educational plans and programs of their collaborators stand a reasonable chance of bringing about the priority behavioral changes specified in the national, district, and local environmental education strategies. Determining this can be difficult if the district environmental officers themselves are relatively unfamiliar with the groups toward whom the programs will be directed.

Thus, to begin with, district environmental officers should determine whether the systematic planning process outlined in section 2 has been applied. If it has not, the probability is great that education efforts will fail to inspire meaningful behavioral change.

If it has, the district environmental officers need to determine whether the steps in the plan clearly relate to each other. Specifically, it should be clear:

- 1) Why the environmental problems have been selected. They should match national, district, or local environmental priorities.
- 2) How the proposed solutions will help resolve the problems. They should be effective, and the education program should have a reasonable chance of bringing them about.
- 3) What obstacles have been preventing the implementation of these solutions. These should be checked to ensure that they can and will be addressed by the education program.
- 4) How the target audiences will contribute to implementing the environmental solution. Is the education program focusing on the groups that can resolve the problem? Is it in the target groups' interests to implement these solutions? Have they helped develop the program's solutions?
- 5) How the program content will lead to behavioral change on the part of the target audiences. Will this information capacitate and motivate the target audiences to implement the solutions?
- 6) Why the program's education strategies have been selected. Are they the best available for communicating the program's content to the target audience? Are they practical?
- 7) How the program will be evaluated. Is it clear what environmental measures are being advocated and how their implementation will be noted in the environment?

The planning process is so logical that it appears simple to implement; in fact, practice is often needed before the process can be effectively applied. Consequently, it will be extremely useful if the district environmental officers develop skill in using the process. They will need to help their collaborators develop sound program plans.

Selecting what to teach the target groups and how to teach it should be left to the educators who best understand the groups and who will be working with them. Thus, the district environmental officers do not have to become experts in wildlife clubs, school-children, farmers, rural women, and wildlife poachers. Wildlife club leaders, school-teachers, extension workers, women's groups, and national park wardens can be trusted to assume the responsibility of identifying specific information and delivery systems.

Besides helping in program planning and design, the district environmental officers will be able to assist environmental education efforts in ways that will vary with each circumstance. Although they will have some ideas about how to involve themselves, they

should not do so without the input of their collaborating educators. The people working directly with the target groups will know a great deal about how the district environmental officers could help. It will not always be easy to resist becoming involved without this input. It is tempting, for example, to produce teaching materials, booklets, and posters without specific requests and input from frontline educators. But without such collaboration, the risk is high that materials and efforts will fail to address the specific characteristics of the target groups so that their behavior ultimately changes.

What the district environmental officers might provide in collaboration

- 1) Official sanction and bureaucratic cooperation and support
- 2) Staff training and advice
- 3) Technical information and other resources

3.3.2. Program implementation by district environmental officers

The district environmental officers will be implementing some environmental education programs themselves, as they will have

the best access to some target groups. In particular, they may be the educators best capable of working with district government officials and committees, because they will be working with them as a matter of course. These officials will be able to influence the environmental behavior of district residents in various ways, notably through developing and enforcing district laws, regulations, and policies.

To educate these officials productively, the district environmental officers must have an idea of what the officials can do so that environmental management will improve. They should perceive how, for instance, changes in laws or policy will address the obstacles to environmental solutions described in the district environmental education strategies. For example, one problem facing a district might be illegal incursions into a local forest reserve to cut wood for charcoal. The solution to this problem would simply be to stop unregulated harvest of the wood. One obstacle preventing the implementation of this solution might well be the absence of a forest reserve policy encouraging local citizens to support conservation of the forest's resources. There may be no reason citizens would find it in their interest to cooperate with the Forestry Department. A change in policy permitting selected communities exclusive rights to sustainably harvest some wood in the reserve could be instrumental in enlisting the communities' cooperation and, therefore, in changing the behavior of their residents.

If the district environmental officer has correctly analyzed the situation, then all of this would be described in the district environmental education strategy. The environmental problem, its solution, the obstacles to implementing the solution, and who, specifically, has to change behavior to solve the problem should all be identified. Now the district environmental officer knows that he or she needs to compel the district forestry officer to

develop and implement a new forest reserve policy that will lead to reduced destruction of the reserve's resources.

The district environmental officer's next task is to determine what the targeted groups need to know so that they are able and motivated to adopt the environmentally sound measures advocated by the environmental education strategies. He or she will need to prepare a list of intended learning outcomes. Intended learning outcomes can include facts, statements, ideas, principles, capabilities, skills, techniques, values, or feelings. The immediate objective of the education program will be effecting these outcomes.

Intended learning outcomes may describe:

- 1) *What* the target public will learn or feel, for example, the farmer will understand that rainwater washes away unprotected soil; or
- 2) *How* the target public will reveal that it has learned the intended learning outcome, for example, the farmer will be able to describe how rainwater washes away unprotected soil.

The advantage of the latter is that it provides a means of evaluating whether the public fully understands the material presented. The educator will be satisfied the learning objectives have been achieved if the farmer describes the soil erosion accurately. The disadvantage is that this means of evaluation may overly restrict the educator. He or she may be satisfied that the farmer has learned the material because the farmer has revealed this through informal conversation or through his behavior. Thus, the educator may prefer to list the program's intended learning outcomes using the first method, if he or she is confident of being able to stay focused on achieving the outcomes and eventually evaluating whether they have been learned.

With the intended learning outcomes in place, the district environmental officers can now select the information to present to the targeted groups. This will simply be the method used to effectively convey the intended learning outcomes to the target audiences.

Targeted groups must be sufficiently knowledgeable and motivated to implement the solutions to the environmental problems. Thus, it will help if the district environmental officers are aware of the target groups' interests. These interests may not relate directly to environmental concerns but may include such things as job security, status, opportunities for promotion, and favorite interests and pastimes. This information may prove valuable. For example, a district forestry officer might be more apt to develop a new forest reserve policy if he feels it will advance his chances for promotion or earn accolades from his superiors. Therefore, the district environmental officer's education effort would be more effective if it highlighted these benefits.

The next step is selecting education strategies that will deliver the program's information to the targeted audiences. District environmental officers may very well rely,

for the most part, on one-to-one communication with colleagues to get their messages across. However, a wide range of strategies exists, each with its own target audience, information to impart, and relative implementation costs. (Some alternatives are summarized in Appendix A.)

3.4. Evaluation

As described in section 2, the ultimate criterion for judging the success of the district environmental officers' education programs will be the resulting environmental. It may, however, require some time before such impact is evident. In the interim, the district environmental officers may assess whether their target groups have learned and believed the information presented in the program. The officers may use formal evaluation instruments, such as written surveys, tests, or questionnaires. They may also rely on informal methods, such as comments dropped in informal conversation, altered behavior, or the impressions of other people familiar with the targeted groups. Formal results are more convincing to agencies, such as NEMA staff or funding organizations based outside the district and, therefore, unfamiliar with the groups. Informal methods will be more accurate when applied by sensitive and perceptive educators. In most cases, a mixture of both formal and informal techniques is the most effective evaluation method.

3.5. Sharing results of the district environmental education programs

If district environmental education efforts are to continually improve so that their environmental impact increases, then the district environmental officers will need to share what they learn through their experiences. They can write up assessments describing their successes and failures, and they can also convene periodically to share insights. It is very important that the district environmental officers be able to learn from each other's experiences and not work in isolation.

4. Implementing Environmental Education in Uganda—the National Perspective

4.1. Introduction

At the present time, a great many organizations are involved in environmental education in Uganda. The "State of the Environment Report for Uganda" describes some of them: the schools at the primary, secondary, and tertiary levels; approximately 780 wildlife club chapters; the national parks; and more than 170 national and foreign nongovernmental organizations (MNR 220-223). In addition, the National Environmental Action Plan Secretariat proposes new key government offices with significant involvement in environmental education.

One such office will be the proposed National Environmental Management Authority (NEMA). This authority's mandate will be to "advise the government of Uganda on environmental policies and strategies, and to provide liaison, technical advice, and coordination with sectoral ministries, district authorities, the private sector, and nongovernmental organizations" (NEAP, "Decentralizing Natural Resource Management" p.3).

One of the authority's five divisions will be the Education, Awareness, and Training Division. This office will consist of a director, an environmental education specialist, a community training officer, a public awareness program officer, and a graphic artist. Its task will be to propose national environmental education policies and to promote and support their implementation in the country (NEAP, "Action Plan" pp.29-32). Within the National Environmental Management Authority, it is intended that this division take the lead in stimulating effective environmental education programs in the country. Actually, however, it is recommended that most of NEMA's staff implement environmental education in the broad sense. This will be discussed below.

The National Environmental Action Plan Secretariat also intends that each district in Uganda have a district environmental officer. Generally speaking, the role of this officer will be to "work with the district executive secretary to ensure the integration and incorporation of environmental concerns in all district development activities" (NEAP, "Draft Proposal" p.37).

Among the many responsibilities of this officer will be that of developing outreach education programs at the district and rural community levels (NEAP, "Decentralizing Natural Resource Management" pp.33-36). This individual will be expected to work closely with the entire range of private and government entities at the district level that have, or could have, environmental impact. These will include the district executive secretary, the district environmental committee, the district technical planning committee, local nongovernmental organizations, the general public, and the district forestry, agriculture, veterinary, fisheries, water, community development, and education officers. The district environmental officers will also serve as the link between NEMA and the

districts. Through him or her, national policies will be translated into local action, and will, in turn, reflect local needs and characteristics.

The district environmental officers will also work closely with the local environmental committees at the municipal and subcounty levels. The National Environmental Action Plan Secretariat suggests that municipalities and subcounties appoint Local Environmental Committees that will essentially perform the same functions as the district committees, but at the local level (NEAP, "Draft Proposal" p.38–39). It is also suggested that some municipalities, at least, appoint a local environmental officer, with responsibilities similar to those of the district environmental officer (NEAP, "Decentralizing Natural Resource Management" p.13).

The challenge confronting these new offices will be to determine what each should do to bring about effective environmental education programs and, conversely, what each should leave for others to do. The goal is to see an array of formal and informal environmental education efforts that reflect both national policies and priorities and also local environmental, political, and social conditions. These offices can encourage the development of such programs in both the public and private sectors. The following section provides suggestions of how the offices, at each political level, can work most effectively in developing sound environmental education programs.

4.2. Environmental education planning

The National Environmental Management Authority will have the responsibility of preparing a national environmental education strategy to guide environmental education efforts at the national and local levels. This would seem to be the responsibility of the Education, Awareness, and Training Division to prepare, of the rest of NEMA to review and comment on, and of the executive director to ultimately present to NEMA's policy committee for approval. The environmental education strategy should identify:

- 1) The priority environmental problems confronting Uganda.
- 2) The solutions to these problems. These should be expressed in general terms (for instance, "Farmers need to employ appropriate measures to control soil erosion"), leaving the specifics to the environmental educators actually working with the target groups.
- 3) The obstacles to implementing the solutions.
- 4) The people who can address these obstacles and thus bring about the solutions.
- 5) What these people have to do to implement the solutions.

Developing a national environmental education strategy in this fashion focuses education efforts, right from the start, on behavioral change rather than "awareness"

development. It ties environmental education directly to the nation's environmental needs; thus, environmental education becomes a priority for the country to implement. The National Environmental Management Authority now has criteria it can use in deciding on which environmental education programs it wants to concentrate its efforts, resources, and money. Potential aid donors can also be relatively confident that NEMA-sponsored or -approved environmental education efforts will effect an improvement in people's welfare and, therefore, are worthy of support.

Two valuable documents, the "State of the Environment Report for Uganda" and "the National Environment Management Policy," will be available to the authority (see bibliography). These documents contain much of the information NEMA needs to develop its environmental education strategy.

It is advisable that the district environmental officers develop district environmental education strategies using the same procedure employed by the National Environmental Management Authority. The NEMA strategy will serve to mesh local environmental needs with national priorities. The environmental issues identified by the national strategy will vary in relative importance between districts; thus, it should be left to each district environmental officer to select which environmental issues in the NEMA strategy deserve priority attention in his or her district. Each strategy should incorporate the input of the district environmental committee, the district technical planning committee, and the local environmental committees at the subcounty and municipal levels. The district environmental committee should ultimately approve the district strategy.

Additionally, local environmental officers at the municipal and subcounty levels should determine priority issues to address within the framework offered by the district strategy.

4.3. Environmental education implementation

The NEMA Education, Awareness, and Training Division and the environmental officers at the district and local levels can now take on the task of seeing the national, district, and local environmental education strategies implemented. For this to happen, environmental education programs must fit the priority needs identified in these strategies. The National Environmental Management Authority and the environmental officers may choose from several routes:

- 1) They may actively seek out and try to collaborate with educators and institutions that they feel can best work with the target groups identified in the strategies.
- 2) They may consider supporting and collaborating with programs and proposals prepared by educators and institutions on their own.
- 3) They can implement education programs themselves. In NEMA's case, although the Education, Awareness, and Training Division will be coordinating the implementation of the national environmental education strategy, personnel in the

other divisions will probably be actively involved in directly educating selected groups.

The options chosen will depend on which educators and organizations can best work with the identified priority target groups. The educators should:

- 1) be in contact with the groups;
- 2) be able to work effectively with the groups because they are trusted by them and because they understand the groups needs, desires, beliefs, concerns, existing knowledge, degree of literacy, and other specific characteristics; and

Requirements for environmental educators

- 1) Be in contact with target groups
- 2) Be trusted by their groups
- 3) Understand and know their groups
- 4) Be able to communicate with target groups

- 3) be able to communicate the information that will empower and motivate the groups to adopt the environmentally sound behavior identified in the environmental education strategies.

4.3.1. Collaboration

Assuredly, the National Environmental Management Authority staff and the district and local environmental officers will identify, using the above criteria, individuals and organizations with which they will want to collaborate in implementing environmental education efforts. The National Environmental Action Plan specifically recommends that the NEMA Division of Education, Awareness, and Training work with the following institutions:

- 1) the Ministry of Education and the Curriculum Development Center, helping develop environmental education curricula;
- 2) the Educational Broadcasting Division of the Ministry of Information, helping develop environmental television and radio programs;
- 3) Line institutions, ministries, nongovernmental organizations, the private sector, and other NEMA staff, helping develop environmental training efforts in a wide variety of subjects; and
- 4) District and local governments.

(NEAP, "Action Plan" pp.29–32)

Whoever NEMA and the environmental officers collaborate with, they will first need to determine that the educational plans and programs of their collaborators stand a reasonable chance of success. Success means bringing about the priority behavioral changes specified in the national, district, and local environmental education strategies. Determining this can be difficult if the management authority and the environmental officers themselves are relatively unfamiliar with the communities and groups toward whom the programs will be directed.

Initially, they should note whether the systematic planning process outlined in section 2 has been applied. If it has not, the probability is great that education efforts will fail to inspire meaningful behavioral change. If it has, they should see whether the steps in the plan or program clearly relate to each other. Specifically, it should be clear:

- 1) *Why the environmental problems have been selected.* They should match national, district, or local environmental priorities.
- 2) *How the proposed solutions will help resolve the problems.* They should be effective, and the education program should have a reasonable chance of bringing them about. Ideally, these solutions should have been developed with the close collaboration of the eventual target groups of the environmental education program.
- 3) *What obstacles have been preventing the implementation of these solutions.* These should be checked to ensure that they can and will be addressed by the education program.
- 4) *How the target audiences will contribute toward implementing the environmental solution.* Is the education program focusing on the groups that can resolve the problem? Is it in the target groups' interests to implement these solutions?
- 5) *How the program content will lead to behavioral change on the part of the target audiences.* Will this information empower and motivate the target audiences to implement the solutions?
- 6) *Why the program's education strategies have been selected.* Are they the best available for communicating the program's content to the target audience? Are they practical?
- 7) *How the program will be evaluated.* Is it clear what environmental measures are being advocated and how their implementation will be noted in the environment?

The planning process is so logical that it appears simple to implement; in fact, practice is often needed before the process can be effectively applied. Consequently, it will be extremely useful if the staff in NEMA's Education, Awareness, and Training Division and

the district and local environmental officers develop skills in using the process. They will need to help their collaborators develop sound program plans.

Selecting what to teach the target groups and how to teach it should be left to the educators who best understand these groups and who will be working with them. Thus, National Environmental Management Authority staff and district and local environmental officers do not have to become experts in wildlife clubs, schoolchildren, farmers, rural women, and wildlife poachers. Wildlife club leaders, schoolteachers, extension workers, women's groups, and national park wardens can be trusted to assume the responsibility of identifying specific information and delivery systems.

In addition to assisting in program planning and design, NEMA staff and the environmental officers will be able to assist environmental education efforts in ways that will vary according to the circumstances. Although they will have some ideas of how to involve themselves, they should not do so without the input of their collaborating educators. The people working directly with the target groups should know a great deal about how national management authority staff and district and local environmental officers can help. It will not always be easy to resist becoming involved without this input. It is tempting, for example, to produce teaching materials, posters, and mass media campaigns without specific requests and input from frontline educators. But without such collaboration, the risk is high that materials and efforts will fail to address the specific characteristics of the target groups so that their behavior ultimately changes.

NEMA staff and the environmental officers could provide:

- 1) official sanction and bureaucratic cooperation and support,
- 2) staff training and advice, and
- 3) materials, funds, transportation, technical information and other resources.

4.3.2. Program implementation by the National Environmental Management Authority

National Environmental Management Authority staff will be implementing some environmental education programs themselves, as they will have the best access to some target groups. Much of their work will require working with counterparts in the line ministries and the district governments. In its "Draft Proposal for a National Institutional Framework for the Management and Coordination of the Environment in Uganda," the National Environmental Action Plan Secretariat proposes several ways NEMA staff could work with line ministries and the districts.

- 1) The executive director will work with:
 - a) The NEMA Management Board, the minister responsible for the environment, and the policy committee on environment. While these entities will be reviewing the executive director's performance, he or she in turn will also be

advising “the board, the minister, and the policy committee on matters relating to the management of the environment and natural resources.”

- b) “Line Ministries, districts, local governments, nongovernmental organizations, and other organizations to ensure proper implementation of the environment policy.”
 - c) “External bodies on matters related to bilateral cooperation in the management of the environment and natural resources.”
- 2) The natural resource management specialists within the Planning, Policy, and Legal Division will work with:
- a) “Line ministries and institutions in planning sustainable land use projects” (soils and land-use specialist).
 - b) “Districts in assessing and incorporating environmental concerns in all their development plans” (soils and land-use specialist).
 - c) “Line ministries, institutions, nongovernmental organizations, and other organizations in the development of their biodiversity projects and programmes” (biodiversity and range ecologist).
 - d) “Districts to incorporate biodiversity conservation in their development plans” (biodiversity and range ecologist).
 - e) “Other divisions and institutions advising on the development of the Environmental Impact Assessment and standard regulations, reviewing existing sectoral laws both at national and district levels, and advising on compliance, enforcement of environmental laws and regulations” (senior environmental lawyer).
 - f) “Sectoral institutions and Foreign Affairs on international environmental concerns” (senior environmental lawyer).
- 3) The Information and Monitoring Division will work with:
- a) “Other agencies on environmental impact assessment,” including establishing “awareness on environmental impact assessment through seminars, workshops, lectures, and other presentations” (environment impact assessment specialist).
 - b) “Other agencies in inspection and monitoring of the environment” (environmental inspector).

- c) "Districts to plan and design their environment\natural resource information management systems" (environmental information systems analyst).

The national and district environmental education strategies will point to specific measures in the areas of policy and enforcement, for example, that both line ministries at the national level and district officials should adopt in order to encourage sound environmental behavior by Ugandan citizens. Since the National Environmental Management Authority staff will be working with ministry and district personnel who could be helpful in getting these measures implemented, NEMA may be the best organization to work with these specific groups.

The National Environmental Action Plan recommends that each ministry working with NEMA establish a small environment unit staffed with 2 to 3 environment liaison officers. In this scenario, the liaison officers would become particular target groups for the NEMA staff.

Thus, while the Education, Awareness, and Training Division of NEMA will be entrusted with coordinating the preparation of the national environmental education strategy and its implementation, much of the NEMA staff will probably participate in implementing it with certain target groups. To maximize the authority's effectiveness, it is critical that:

- 1) The staff in all divisions provide input into the development of the national environmental education strategy and buy into it, and that the executive director approve it. This will help ensure their commitment to implementation.
- 2) The staff members in the Education, Awareness, and Training Division coordinate the activities of the remainder of NEMA as regards strategy implementation. This means that they should be able to identify the particular groups in the line ministries and districts most effectively reached by other NEMA staff. The personnel in this division should then work with their colleagues in the other divisions to help them pinpoint the desired line ministry and district actions, and then help develop the information and delivery strategies to help bring these actions about.

The district environmental officers, meanwhile, will probably be able to educate those entities with whom they will be working, such as the district resistance councils, the district technical planning committees, the district executive secretary, environmental committees at both the district and local level, the district forestry, education, water, community development, veterinary, and agriculture officers, and a wide range of other public and private individuals and institutions.

To be successful in changing people's behavior, management authority staff and the district environmental officers will need to know their target groups well. Among other things, they will need to know their groups':

- 1) Potential for helping bring about sound environmental behavior on the part of Ugandan citizens. What can they accomplish in the positions they hold?
- 2) Main interests and concerns, both environmental and otherwise (for example, promotion, status, job security, pet projects, favorite geographic areas, and approval of superiors).
- 3) Attitudes toward the National Environmental Management Authority staff and the district environmental officers.
- 4) Prior environmental knowledge. If it is a good idea that the public do something differently, then why isn't it already being done?
- 5) Ways of obtaining new information.

4.4. Evaluation

As described in section 2, the ultimate criterion for judging the success of environmental education programs is the environmental impact they produce. It may, however, require some time before such impact is evident. In the interim, the National Environmental Management Authority and the district environmental officers may assess whether their target groups have learned and believed the information presented. The district environmental officers may use formal evaluation instruments, such as written surveys, tests, or questionnaires. They may also rely on informal methods, such as informal conversation, altered behavior, or the impressions of other people familiar with the targeted groups. Formal results are more convincing to funding and supervisory agencies that are unfamiliar with the target groups. Informal methods are more accurate when applied by sensitive and perceptive educators. In most cases, a mixture of both formal and informal techniques is most effective.

4.5. Preparing case study reports

Environmental education case studies of programs carefully planned around resolving environmental problems can be useful to guide educators and advance the field, but not readily available. Has any country specifically defined what environmental impact it hopes to bring about through environmental education and how it hopes to achieve it? Curricula, education materials, campaigns, and other programs exist and can serve to inspire efforts in different countries. But rarely is it demonstrated that such efforts have led to any specific environmental consequences, usually because such programs have been designed without any specific environmental consequences in mind. As a result, much still needs to be known about how best to use education to further sound environmental management.

Uganda is in a unique position to set an example for environmental educators in other countries. With careful planning and adequate training, follow-through, and support, educators in a wide range of capacities and situations may be able to use education

strategies specifically directed toward a great variety of critical environmental issues. The eventual impact of these education programs can be assessed. Written accounts of their experiences, both successes and failures, would be of tremendous use both within and outside the country.

Environmental education needs to play a critical role if the world's natural resources are to be managed sustainably. Yet education often falls short in realizing its potential environmental significance. By sharing its experiences through written case study reports, Uganda could make an important contribution to environmental management efforts throughout the world.

Appendices

Appendix A. Survey of environmental education strategies

Various frequently employed environmental education strategies are compared below. Educators can expect to come up with points not discussed here or to disagree with points that are presented. The purpose here is not to be the last word on environmental education strategies, but rather to demonstrate how to systematically select strategies to fit specific environmental situations and to generate instructive discussion. To that end, significant factors to consider when choosing strategies are presented in the following tables.

Table 1. Extension programs

Audience	Individual adults or groups of adults with common interests
Expense	Relatively expensive; labor intensive
Amount of information	Much
When appropriate	When large quantities of information need to be adapted to specific situations. While other educational approaches can increase people's awareness of environmental issues, extension programs are often needed to build on such awareness before people's behavior ultimately changes.
Strengths	<ol style="list-style-type: none"> 1) Generally the most effective way of communicating large amounts of site-specific environmental management information to adults. 2) Well-trained and motivated extension workers understand, and are trusted by, the people with whom they work. 3) Extension workers can spend a lot of time with individuals.
Weaknesses:	<ol style="list-style-type: none"> 1) Relatively expensive and time-consuming per person contact-hour. 2) Often agents are poorly paid and motivated and often they lack adequate transportation to reach clients.

Table 2. School programs

Audience	School students; also community residents who can be educated by students, either informally in the home or formally through student projects
Expense	Relatively expensive; labor intensive
Amount of information	Much
When appropriate	<ol style="list-style-type: none"> 1) When the goal is to train tomorrow's adults in environmental management 2) When students can contribute now to resolving environmental issues 3) When students can effectively communicate with adults in the community
Strengths	<ol style="list-style-type: none"> 1) Can present large amounts of material to large numbers of schoolchildren 2) Can effectively instill environmental ethic in young, impressionable children 3) Can effectively reach many adults in the community

Table 2. School programs (continued)

<p>Weaknesses</p>	<ol style="list-style-type: none">1) A significant gap may exist between the time when students learn something and the time when they have a chance to apply it2) Some schools may not be flexible enough to allow effective environmental education to occur3) School curricula can require a great deal of time and money to prepare4) Teachers are rarely adequately skilled in environmental education, requiring much training. Poorly paid rural teachers are not always motivated to do extra work.
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Table 3. Clubs

Audience	Organization memberships of all ages and with a broad range of interests, objectives, and capabilities
Expense	Inexpensive to expensive
Amount of information	Much
When appropriate	When a recognized need can be addressed by a particular group and when addressing the need is within the interests of the group
Strengths	<ol style="list-style-type: none"> 1) Club members are usually committed and motivated 2) Youth clubs enjoy more flexibility than schools and thus are freer to explore environmental topics in depth
Weaknesses	<ol style="list-style-type: none"> 1) Money is often in short supply for clubs, hindering effective programs 2) Making programs enjoyable for club members may sometimes compromise educational goals 3) Volunteerism may be a liability during long-term, difficult conservation efforts

Table 4. Mass Media

Audience	The general public; also specific target groups such as farmers, homemakers, and students
Expense	Comparatively inexpensive, considering the numbers of people with whom mass media can communicate
Amount of information	Superficial in general news-oriented media efforts, e.g., in the daily newspaper or regular radio show. Extensive in programs specifically directed at particular target groups, e.g., radio shows concerning child care or public health, or school newspaper supplements.
When appropriate	When the goal is to increase superficial awareness of the general public or to communicate more in-depth information to specific target groups who listen to the radio, buy newspapers, etc. Information cannot be as site-specific as that which can be relayed through extension programs.
Strengths	<ol style="list-style-type: none"> 1) Can reach great numbers of people relatively inexpensively 2) Can be adapted to a wide range of audiences and purposes.
Weaknesses	<ol style="list-style-type: none"> 1) Conservation message may be significantly compromised by newspaper, radio, and other mass-media policies 2) Sometimes require personal follow-up by extension agents for especially detailed and difficult material.

Table 5. Special printed materials: brochures, fliers, coloring books, comic books, story books, “photo novels,” etc.

Audience	General public; also specially targeted groups, both literate and illiterate
Expense	Relatively expensive
Amount of information	Superficial
When appropriate	When the goal is to communicate simple concepts to large numbers of people
Strengths	<ol style="list-style-type: none"> 1) Can reach large numbers of people relatively inexpensively, though usually not as cheaply as mass media 2) Educator can be more in control of message and does not need to compromise message to fit mass medium’s policies 3) Can be kept and referred to repeatedly by target audiences 4) Some types can be sold to raise money for conservation purposes
Weaknesses	<ol style="list-style-type: none"> 1) Compared with mass media, usually more expensive to educator, since no mass medium is footing the bill. 2) Does not enjoy access to mass-media writers, photographers, layout specialists, artists, and circulation routines

Table 6. Exhibits and demonstrations

Audience	The general public; also specially targeted audiences, e.g., an exhibit in an agriculture office for farmers or an exhibit in a school for students and their parents
Expense	Inexpensive to expensive, depending upon the exhibit
Amount of information	Superficial to medium
When appropriate	When a specifically targeted group is known, or can be convinced, to frequent a particular place for a sufficient length of time
Strengths	<ol style="list-style-type: none"> 1) Demonstrations of conservation principles and techniques can be very effective in affecting people's attitudes and beliefs. They are usually more credible than the printed page. 2) Exhibits can last indefinitely, with appropriate maintenance 3) Attractive exhibits can attract people, at which time follow-up education can occur
Weaknesses	<ol style="list-style-type: none"> 1) Educator has minimal control over who visits the exhibit and how carefully he or she looks at it 2) Materials and space may be expensive and hard to come by 3) Maintenance may be expensive and difficult; vandalism may be a problem

Table 7. Community tours

Audience	Specific groups of people with common interests
Expense	Varies according to method of transportation used (motorized vehicles, as compared with bicycles or walking) and distances covered
Amount of information	Medium
When appropriate	When environmental problems and measures to address them can be observed in the community
Strengths	<ol style="list-style-type: none"> 1) Observing environmental practices actually being applied successfully or environmental problems affecting a community can be very effective in convincing people to take action 2) Small group format allows for much questioning, discussion, and processing of information 3) Group members can inspire each other to take action and can arrange to work together and support each other's efforts
Weaknesses	<ol style="list-style-type: none"> 1) Can be expensive; logistics of informing, gathering, feeding, transporting, and returning people to their homes can be difficult

Table 8. Traveling road shows

Audience	The general public
Expense	Frequently expensive, considering gasoline, travel
Amount of information	Superficial
When appropriate	When simple concepts need to be delivered to the general public in remote areas
Strengths	<ol style="list-style-type: none"> 1) Can cover a lot of territory in remote areas 2) Often attract a lot of attention in rural villages 3) Can help long-term environmental education efforts maintain momentum
Weaknesses	<ol style="list-style-type: none"> 1) Attract lots of attention in rural villages, but follow-up will almost always be required for behavioral change to occur 2) Can be very expensive; equipment such as generators and slide projectors break down from travel over dusty, bumpy roads 3) Educators must spend a good deal of time traveling and maintaining equipment

Table 9. Special events

Audience	The general public
Expense	Can be relatively inexpensive, if volunteer time can be relied on
Amount of information	Superficial
When appropriate	When the goal is to galvanize volunteer participation or to focus the general public's attention on selected environmental issues
Strengths	<ol style="list-style-type: none">1) Very effective in rallying short-term volunteer participation2) Effectively focuses public's attention on issues
Weaknesses	<ol style="list-style-type: none">1) Intensity of events cannot be sustained for long2) Usually, behavioral change will not occur without additional educational efforts

Table 10. Songs, proverbs, plays, dance, puppet shows

Audience	The general public
Expense	Can be relatively inexpensive, if volunteer time can be relied on
Amount of information	Superficial to medium
When appropriate	When such forms of communication are considered reliable ways of transferring information
Strengths	<ol style="list-style-type: none"> 1) Sometimes the most effective way to communicate in cultures where oral traditions are important 2) Promise of entertainment can attract large audiences
Weaknesses	<ol style="list-style-type: none"> 1) Can be difficult for educator trained in Western-style manner to appreciate the potential of such means of communication

Table 11. Miscellaneous materials: T-shirts, place mats, posters, buttons, bumper stickers, etc.

Audience	The general public
Expense	Can be relatively inexpensive, considering the numbers of people these materials reach
Amount of information	Very superficial
When appropriate	When the goal is to increase people's awareness with very simple messages
Strengths	<ol style="list-style-type: none"> 1) Can reach people who might otherwise not encounter environmental information 2) Can raise money for education programs
Weaknesses	<ol style="list-style-type: none"> 1) Information must be very superficial; follow-up will be required for behavioral change to occur

Table 12. One-to-one communication

Audience	Formal and informal community leaders
Expense	Can be inexpensive, with no materials
Amount of information:	Can be extensive, depending upon the time the educator can spend with the target audience
When appropriate	When one or a few individuals are the key to influencing people's environmental behavior
Strengths	<ol style="list-style-type: none"> 1) Work with just one influential leader can have major impact on others in community 2) Often requires no materials or special equipment
Weaknesses	<ol style="list-style-type: none"> 1) All eggs put into one basket; much educator effort is invested in one person or a few people, so technique is comparatively risky 2) After all this effort, the person may change positions, perhaps to one less useful to educator 3) Person may not want to share information with others, perhaps because of poor relations with others or perhaps because exclusive possession of information might be thought to be in person's interests

Appendix B. Incorporating environmental education in the schools

Determining when to develop school environmental education programs

Developing environmental education programs in schools is almost always a worthwhile pursuit, but it is not always the top environmental education priority. Environmental educators want to use their time to produce maximum environmental impact, and it may be that limited time needs to be spent with target groups other than schoolchildren and their teachers. In employing the environmental education planning process described in section 2, educators may decide to work with schools if they determine that:

- 1) schoolchildren can play a key role in resolving priority environmental issues in the district;
- 2) priority environmental issues are already being addressed in other environmental education programs, so the educators are free to focus on educating tomorrow's adults for long-term environmental benefit; and
- 3) schoolchildren comprise the group with which the educator is best equipped to work.

At least one of these criteria should be met before educators become involved in the schools. It is often tempting for environmental educators to jump into school-curriculum development projects without first having carried out the planning process described above to determine the best use of their time and resources.

If the National Environmental Management Authority staff, the district environmental officers, and others do conclude that schoolchildren constitute a priority target audience for environmental education, they will need to follow several steps in order to be successful:

- 1) Define exactly how the schoolchildren are to contribute to resolving environmental issues. For example, are they going to be plowing on the contour, planting woodlots, or educating the adults in the community?
- 2) Determine what they need to know in order to be empowered and motivated to carry out these actions. With this information, educators can compile intended learning outcomes.
- 3) With the intended learning outcomes in hand, determine where in the schools the environmental education messages can be most effectively taught.

Determining where to incorporate environmental education into schools

Environmental educators need to determine:

- 1) the grade levels at which the material will be taught, and

- 2) where within the school structure the material can be taught.

First, they need to consider how old children have to be in order to understand the material. If environmental educators are not familiar with schoolchildren, they need to work with people who are. These counterparts should be able to look at environmental education learning objectives and, based on knowledge of the developmental stages of children, be able to suggest the appropriate grade levels at which environmental education efforts can be presented. Obviously, for younger children concepts must be simple and concrete and must not require advanced thinking skills or extensive prerequisite knowledge.

Second, educators need to find where in the school curriculum their material will be allowed to fit. Again, they may need assistance from people knowledgeable about schools or school systems. Possible ways to incorporate environmental education include:

- 1) infusing the information through a range of courses (some of the information surfacing in biology class, for example, the rest appearing in history, art, and language arts, etc.);
- 2) presenting the information all together in a discrete course, such as conservation or environmental studies; or
- 3) delivering the information in after-school activities.

The “National Environment Management Policy” of March 1995 maintains that environmental education should be infused throughout the existing curriculum, rather than taught in discrete courses (section 3.13). But there are advantages and disadvantages to each approach:

- 1) The infusion method—environmental education throughout curriculum

Advantages:

- a) Fewer resources may be needed (the infusion method doesn't require an environmental education specialist or a separate textbook, etc.)
- b) Doesn't compete with other standard subjects; doesn't compete for a slot in the curriculum
- c) Can be done immediately, without core curriculum development
- d) Encourages transfer of learning and integrated problem-solving across the curriculum
- e) Appropriate for all age levels, although may be more difficult at upper grades
- f) When done on a large scale, can continually reinforce and build upon key environmental concepts

Disadvantages:

- a) Difficult to infuse environmental education; it may require extensive teacher training
- b) Environmental education message can be so diluted to fit the objectives of a course that it can get lost
- c) Very difficult to relate concepts to one another, if they are taught at different grade levels and in different courses by different teachers
- d) Very difficult to evaluate an environmental education effort that is so diffuse
- e) Very difficult to maintain quality control; teachers leave and are replaced, leaving gaps in the program

2) The discrete environmental course

Advantages:

- a) Easier to implement as a single subject
- b) Allows teachers to present concepts that build on one another throughout the course
- c) Teacher training is somewhat easier, although it requires teachers to have a more in-depth background
- d) Much easier to evaluate success and to maintain quality control
- f) Pulls everything together for students and can achieve greater depth and comprehension
- g) Gives environmental education the priority it deserves

Disadvantages:

- a) Often hard to convince schools and school systems to carve out a place for the course
- b) Needs trained environmental teachers
- c) Not as easy to see the connections with other subjects
- d) May limit the number of students exposed

Environmental education may very well be most effective in schools when it is taught in a discrete course that is then reinforced in other courses. Relying solely on infusion may significantly limit the complexity and depth of the material that can be presented.

When infusion is, at least in part, the strategy chosen, then environmental educators need to take their list of objectives and match each one with the stated or potential learning objectives found in existing course descriptions. Having done this, they can suggest where environmental education can be taught. Perhaps, for instance, children will learn the beauty of trees in third grade, how to plant them in fifth, and how they are pollinated in seventh.

The importance of having prepared intended environmental learning outcomes before this stage is clear. Without them, the risk is great that environmental education efforts will become so compromised to fit school learning objectives that they become ineffectual. Educators need to know what they want to teach before adapting their efforts to fit the courses into which their material will be infused.

Working against the National Environmental Management Authority staff, district environmental officers, and others who want to incorporate environmental education into local schools are the pressures Ugandan teachers face as they try to comply with a national curriculum that has goals and objectives other than environmental education. Teacher and school effectiveness is largely determined by how well students perform on standardized tests, particularly the national exams administered at the end of primary year seven and secondary year four. If environmental education programs do not help teachers and students do well on these exams, but rather consume class time with other subject matter, resistance to implementing programs can be expected. Ideally, material in new environmental education programs will closely match course learning objectives that are assessed by year-end national exams. Ideally, as well, district school systems can feel free to adjust their programs to match district priorities, even if this takes time from learning the national syllabus. Realistically, however, conflict can arise between environmental education learning objectives and course standardized tests. This is one reason environmental educators need support for new environmental education programs.

Obtaining buy-in for the environmental education program

For the program to be successfully implemented, the support of various people associated with the school will be needed. Who these people are will vary among schools, but they should include the district education officer, the district environmental council, school administrators, teachers, parents, and even students. Additionally, local conservationists, nongovernmental organization representatives, and business leaders might also have to be on board. Usually, the sooner these people become involved with the education effort and the more they participate in creating it, the more enthusiastically they will support it.

Preparing teaching materials

Teachers will certainly need materials to help them teach this new program. Necessary materials include:

- 1) reference materials which provide information about the subject matter in the program;
- 2) textbooks for the students to read and the teachers to use in providing course structure;
- 3) activity guides that present ideas to the teachers for teaching the material in effective, creative, and enjoyable ways;
- 4) visual aids, such as posters, flipcharts, pictures, slides, and models; and
- 5) teaching materials, such as game boards, scientific equipment, chemicals, and even pens, paper, glue, construction paper, scissors, string, and chalk.

Materials may be very scarce in the districts, so the district environmental officer should consider what may be available before launching the environmental education effort. Otherwise, the program may prove to be impractical.

Pilot testing the new materials

New educational programs should always be pilot tested before they are distributed in final form. Pilot testing involves identifying a small number of teachers who represent the schools, grade levels, and courses in which the materials are to be used and who agree to try them out in their classrooms. This serves not only to identify problems with the programs, but also to train a small cadre of teachers to use them. These teachers, in turn, can train others.

To motivate teachers to pilot test the materials in their classrooms and to pass on their assessment of the materials' effectiveness, the district environmental officers can use several strategies:

- 1) honoraria,
- 2) certificates signed by the Ministry of Education or district environmental officer recognizing the teachers' contributions,
- 3) publicity in newspapers about the new program and the teachers involved in testing,
- 4) teaching credit or bonuses,
- 5) free environmental education materials.

Teacher training

Once materials and curricula have been developed and pilot tested, teachers will have to be trained to use them. Teachers can be trained in the District Teachers' College. Working teachers are usually trained in hands-on workshops, during which teachers try out the new programs of

study under the guidance of those familiar with their use. Often teachers who have pilot tested the materials make effective trainers. Many school environmental education programs involve such progressive techniques as cooperative and discovery learning; many teachers, on the other hand, are accustomed to relying on "chalk talk." In addition, most teachers are unfamiliar with environmental education and have not been trained in it. Thus, it may take a while for teachers to become comfortable with the new program. District environmental officers will need to scale their goals to the limitations of the teachers who will be implementing them.

Maintaining program support

The success of the environmental education program depends on the continued support of teachers, parents, school officials, funding sources, local environmental nongovernmental organizations, and other interested parties. There are several ways to ensure the continued support of the environmental education program:

- 1) *Publicity.*—The students can share what they have been doing—essays, posters, displays, etc. They can present special events, such as environmental fairs, community clean-ups, or tree-planting demonstrations. And they can inform radio stations and newspapers about their activities. Environmental education newsletters are used in some countries to keep people informed.
- 2) *An ongoing advisory committee.*—Such a committee can help keep the environmental education program current and help promote, and engender support for, the program.
- 3) *Success.*—Students learning exciting, relevant, and interesting material; teachers doing worthwhile work with cooperative students; higher standardized test scores; and improved district environmental conditions warrant continued support.

Appendix C. People contacted while in Uganda

Kampala

Martin Odwedo	Decentralization Specialist, Ministry of Local Government
Dr. James Seyler	Chief of Party, Action Program for the Environment–National Environmental Action Plan
Raymond Victurine	Coordinator, Grants Management Program, Action Program for the Environment
David Mutekanga	Executive Secretary, East African Wildlife Society
Dr. Derek Pomeroy	Professor, Makerere University

Kasese District

Asa Kule	District Environmental Officer District Education Officer
Edgar Mbahamaza	Assistant District Executive Secretary
Johnson Biterabehe	Former District Executive Secretary, Kasese, now District Executive Secretary, Bushenyi
Francis Nkulega	Education Officer, Queen Elizabeth National Park
Chief Research Officer	Mweya Ecology Institute
Eunice Kang	Peace Corps volunteer assigned to District Environment Office
Erwin Masinsin	Peace Corps volunteer assigned to Queen Elizabeth National Park

Mbale District

Peace Onzia	District Executive Secretary
Kahika Giles	Assistant District Executive Secretary
Okujo James	Assistant District Executive Secretary
Oyango Gershom	Project Manager, Mt. Elgon Conservation and Development Project
Henk Hoefsloot	IUCN Technical Advisor, Mt. Elgon Conservation and Development Project
Collins Oloya	Extension Worker, Mt. Elgon Conservation and Development Project
Steven Nasasa	Educator, Mt. Elgon National Park
Richard Ojul	District Forestry Officer
William Magomu	District Water Officer
Paul Tetu	Peace Corps volunteer assigned to district environmental management Officials in District Agriculture, Education, and Community Development Offices

In Mbale, a meeting was held in which district representatives shared views on a working draft of the guidelines. Attending the meeting were representatives from the offices of community development, agriculture, water, veterinary services, education, and the district executive secretary, as well as IUCN, Mt. Elgon National Park, and the Municipal Council.

In Kampala, the following individuals met and shared comments regarding the working draft of the guidelines:

Martin Odwedo	National Environmental Action Plan
F.W. Kawazi	Department of Environment
M. Lwanga	Wetlands Program
Beatrice Adimola	National Curriculum Development Center
Nightingale Nantamu	USAID
Robert Ekaju	Wildlife Clubs of Uganda
Jim Seyler	Chief Technical Advisor, National Environmental Action Plan
Ray Victorine	Grants Management Unit–Action Plan for the Environment
Nelson Mukiibi	Grants Management Unit–Action Plan for the Environment
Samson Werikwe	Uganda National Parks

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