

## REGIONAL ISSUES IN ENVIRONMENTAL EDUCATION

Ben Tyson

### ABSTRACT

This paper presents a panorama of the African environmental education and communication (EE&C) landscape as it relates to natural resource management by capturing a view of past and current endeavours in The Gambia, Madagascar, Namibia, and Uganda and by positing a potential vision of future activities. On-site qualitative methods were employed. Observations are discussed in terms of their relevance to public and private sector support for a) formal EE&C (curriculum, teacher training, instructional materials), b) nonformal EE&C (adults/out-of-school youth continuing education programmes, extracurricular school youth programmes, public sector extension education systems, multi-media social marketing campaigns), c) community based EE&C, and d) interpretive EE&C.

### INTRODUCTION

Much of the information used in writing this paper was obtained from four country specific reports written for the USAID, funded GreenCOM Project during 1994. These reports assessed the status of environmental education and communication (EE&C) activities in The Gambia, Madagascar, Namibia, and Uganda. Methods of information collection were primarily qualitative. Open-ended interviews, focus group discussions, on-site visits, and document reviews were employed by contracted consultants. Findings were cross checked with different sources to confirm validity when possible. The author of this paper, who at the time served as GreenCOM Project Director, personally assisted with in-country activity for the Namibia and Uganda assessments. It should be noted that the interpretations and conclusions expressed in this paper are entirely those of the author and should not be attributed in any manner to the consultants, the GreenCOM Project, the Academy for Educational Development (the project's prime contractor), or USAID.

### DEFINITIONS

Environmental Education (EE) can be defined as

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 towards solutions of current problems and the prevention of new ones. (Belgrade, 1975 and Tbilisi, 1977).

This definition is broad enough to encompass four

distinct areas of EE and "C" (communications) - formal, nonformal, community based, and interpretation. Each area has its own unique set of objectives and tools.

*Formal EE&C*, for the sake of this paper, will pertain to primary and secondary level formal education: a) curriculum design, b) teacher training and c) instructional materials development. The objective of formal EE&C is to develop in school-based individuals the capacity for, and the commitment to engage in, inquiry, problem solving and decision-making on a broad range of environmental issues, including those that are not acute or not directly or locally perceived, and generally with a long-term focus within a broad social and ethical framework. Interpersonal channels and print media are most commonly employed (adapted from Archie, Mann & Smith, 1993).

*Non-formal EE&C*, for the sake of this paper, consists of four tools: a) adult and out-of-school youth continuing education programmes, b) extracurricular programmes for students, c) programmes conducted by public sector extension education systems, and d) multi-media social marketing campaigns. The objectives of non-formal EE&C are not as neatly defined as with other forms of EE&C. Continuing education and extracurricular programmes seek changes in knowledge and skills, in fairly broad audiences, and rarely advocate specific solutions for acute issues; yet, these programmes are generally mounted in response to perceived needs. Programmes launched by extension education systems seek changes in awareness, knowledge, attitudes, and skills but often for targeted groups of individuals. These programmes often advocate specific answers for topical issues and rely on both interpersonal and mass media to do so. Social marketing campaigns generally deal with critical

issues, seek change in behaviour, advocate specific messages, target specific audience, and rely heavily on mass media.

*Community based EE&C* refers to participatory development and aims to empower communities to take control of their own future. Community based EE&C is often launched by local and international NGOs working in consort with community development committees or similar organisations. These activities are often framed by borders of a watershed or peripheries of national parks. An ecosystem approach is often followed that integrates the economic and ecological concerns of the whole community in a sustainable fashion. Methodologies employed rely heavily on interpersonal channels, and include a focus on organisational communication, leadership, decision-making, and programme planning.

*Interpretive EE&C* refers to activities mounted for the visiting public of national parks, forests and wildlife reserves and involves such tools as displays, maps, trail signs, fact sheets, guide books and lectures. The objective is both education and recreation. Interpretation activities are often viewed in a marketing sense as part of the product being provided to visitors. The revenue that is generated by admission fees can be shared with border communities as an incentive to cooperate with conservation efforts or can be used by park staff to support non-formal and community-based EE&C initiatives.

## STATUS: ENVIRONMENTAL EDUCATION AND COMMUNICATION

EE&C methods are important keys to achieving support for and implementation of national environmental policy. Formal EE&C is needed to establish environmentally literate youth as a foundation for society. Non-formal EE&C is needed to address acute issues. Community-based EE&C is needed to empower communities. And interpretive EE&C is needed to support national park systems.

One common factor that all four types of EE&C share concerns the manner in which programmes are carried out. Regardless of the type of EE&C, programme development is best treated as an iterative process of a) formative research and analysis; b) planning; c) developing, pre-testing, and refining concepts; and d) implementation and monitoring (adapted from Novelli, 1984). As a trend across all types of EE&C and all four

countries studied, it was found that formative research, pre-testing and monitoring capabilities need bolstering. Other noteworthy findings tend to be more specific to particular types of EE&C and/or specific to a particular country. These are discussed on the following pages.

## FORMAL EE&C

### Curriculum Development

Environmental curricula can take two forms: an "infusion method" whereby environmental issues are dealt with throughout the total curriculum by being infused into any subject matter and a "block method" whereby separate and distinct environmental education courses are created (Braus and Wood, 1993). Both forms have associated pros and cons. Ultimate effectiveness probably comes from a blend of both methods.

Across the four countries studied, primary and secondary environmental curricula can be considered the strongest in The Gambia and Namibia. Both countries employ a blend of infusion and block methods. Pertaining to Namibia, prior to independence, the exiled Southwest Africa People's Organisation (basis for the present government) received Danish assistance in the form of formal education support. An initial focus of this work concerned food production. These early efforts helped to jump-start the process of curriculum reform. Now, environmental issues are infused in the grade 1-3 social science curriculum and grade 4-7 science and health curriculum; the grade 8-10 "Life Science" curriculum deals with environmental issues when addressing blocks on health, biology, ecology and agriculture; and the senior secondary "Natural Economy" curriculum, geared for students who will sit Cambridge exams, deals with global environmental issues.

Uganda and Madagascar are in the midst of a national curriculum reform process - each for different reasons, each with different goals. Formal education in Uganda, supported by The World Bank and USAID, is undergoing long needed improvements. The Ministry of Education's National Curriculum Development Council is a recipient of this assistance. Present efforts are concentrating on basic curricula. It is not clear to what extent environmental studies will be incorporated. Efforts to infuse environmental issues need to be supported now. The new government in Madagascar has initiated a broad educational reform process and hopes to have a new secondary

curriculum in place by 1996 and new primary curriculum by 2000. Historically, curriculum support and associated teacher training and instructional materials development activities have received fundamental assistance from non-governmental organisations (NGOs). In the past, the World Wildlife Fund played such a role and because of this, environmental issues were ensured inclusion. The ongoing educational reform process has not yet sought this support. Special efforts will need to be expended to maintain the infusion of environmental issues in basic curricula and ensure that teacher training and instructional materials development activities are mounted to support environmental issues.

### Teacher Training

Teacher training in all four countries is generally a responsibility shared by NGOs and Ministries of Education. In Namibia, the ministry has adopted a three year Basic Teacher Education Programme that addresses environmental issues in the study of natural science in year one. The ministry has also adopted a "cascade model" of teacher training for the Life Science curriculum. Training is conducted at a national level for facilitators, who then conduct regional teacher workshops, followed by workshops for clusters of schools, followed by site visits. The Desert Resource Foundation of Namibia (DRFN) provides a good example of NGO collaboration which is fairly common in the country. This group has developed and tested mini-curricula and resource books for secondary teachers on energy, water and population issues that will be part of the ministry's Basic Teacher Education Programme.

Teacher training activities in The Gambia and Uganda are similar to Namibia in that NGOs and Ministries of Education share the work load but environmental activities are much more rudimentary. In The Gambia the Ministry of Education, in an effort to re-establish systematic inservice teacher training, conducts a Regional Support for Education and Training of Teachers (RESETT) programme that focuses on maths, science and english. Environmental and social studies have yet to be included. In Uganda, neither the single degree programme nor the three diploma level programmes conducted by the Institute of Teacher Education include environmental education in their curriculum. From a private sector perspective, the Chimp Rehabilitation Project and the Training and Information on the Protection of the Environment (TIPE) Project in The Gambia produce mini-curricula and associated materials and

conduct *ad hoc* training workshops for teachers. In Uganda several NGOs, frequently in collaboration with local Wildlife Clubs, engage in similar activities. The majority of this work goes untested.

### Instructional Materials Development

The development of instructional materials is fairly strong in The Gambia and Namibia where the process is truly a collaborative effort between NGOs and Ministries of Education. In The Gambia, the ministry's Book Production and Materials Resource Unit, a modern and well equipped facility, attempts to service all grade levels. Pertaining specifically to EE&C materials, the non-governmental Chimp Rehabilitation Project produces activity booklets for grade four and five students in border villages of the River Gambia Park; and the TIPE project produces activity booklets and teacher guides for grades four and five students nationwide. There are quite a few other examples of private sector *ad hoc* production of materials in The Gambia. As a general rule, this work is untested and unevaluated. In addition, these materials are dispersed and hard to access. The Peace Corp's environmental education programme is in the process of setting up multimedia educational resource centers to facilitate the collection and dispersal of materials.

A nearly identical situation is found in Namibia - the Ministry of Education maintains teachers resource centres and NGOs assist in developing materials. Examples are the Cheetah Conservation Fund, Desert Resource Foundation of Namibia, Namibia Animal Rehabilitation, Research, and Education Center (NARREC) and Integrated Rural Development and Nature Conservation (IRDNC). The Madagascar situation, until recently, was also similar and EE&C-related instructional materials were readily produced in the Malagasy language. Now the educational system is switching to French and new materials will be required. In Uganda, few EE&C resource materials exist. Those that do are for the most part developed *ad hoc* by NGOs. Makerere University's Institute of Environmental and Natural Resources, in an effort to promote a better fit between scientific findings and basic education, developed some teacher training materials. Much remains to be done.

## NONFORMAL EE&C

### Adult/Out-of-School Continuing Education Programmes

Continuing education programmes for adults and out-of-school youth are generally mounted in response to a perceived need for specific knowledge or skills; i.e., literacy, health and vocational needs. Most of these programmes can serve as a vehicle for EE&C. Literacy education can effectively employ environmental examples to illustrate lessons. Health issues are frequently aligned with environmental topics and vocations that rely on the exploitation of natural resources, such as agriculture and eco-tourism, inherently incorporate EE&C. Because of the high number of out-of-school youth in the four countries studied this form of non-formal education is very important.

In The Gambia the Ministry of Education's Department of Nonformal Education, through regional offices, conducts a literacy education programme. The Gambia Technical Training Institute also teaches literacy courses and a bird guide training course to support eco-tourism is about to be launched. Two NGOs, Action Aid and Save the Children conduct literacy, health and vocational training workshops as part of their community development efforts.

In Namibia the Ministry of Education's Department of Adult and Continuing Education conducts a well designed National Literacy Programme that unfolds in three stages: 1) read and write in mother tongue, 2) functional literacy in mother tongue, 3) functional literacy in English language. The programme employs District Literacy Officers who teach and oversee the work of local Literacy Promoters who conduct classes for fellow community members. Support for environmental issues is one of the ten stated aims of the programme. Pertaining to private sector activity, the Rossing Foundation and the Nyae-Nyae Foundation include literacy, health and vocational training in their development assistance portfolios. Similar types of activity can be found in Madagascar.

In most cases, the infusion of environmental issues into literacy training materials is rudimentary and instructional materials to support continuing

education programmes go untested and unevaluated. In addition, because of the idiosyncratic nature of message development by individual institutions and the lack of coordination among these institutions across the various forms of continuing education, there is a risk of passing conflicting messages. In addition, across all four countries studied, there is an issue of access based on gender. It is evident that special efforts are needed to tailor programmes to accommodate the many factors that compete for women's time.

### Extracurricular School Youth Programmes

Extracurricular programmes for school-based youth include such activities as: field trips to view exhibits/demonstrations, contests for environmental science projects, environmental art competitions, residential environmental camp experience and eco-clubs. In Namibia NARREC hosts frequent field trips for school groups. This NGO specialises in the care and rehabilitation of injured/disoriented wild game and conducts activities which alert students to wildlife conservation issues. Also in Namibia, the Ministry of Youth and Sport conduct "Wilderness Expeditions", one week residential camp experiences at four different locations. In The Gambia the National Environmental Agency recently launched an annual Environmental Awards Scheme which promotes national recognition for sound environmental practices by schools, civic groups, businesses and individuals.

In Uganda, extracurricular eco-clubs have proven resilient. The well established organisation, Wildlife Clubs of Uganda, has 130 active youth clubs each supported by community patrons. These patrons are often primary and secondary schools. These clubs seek to increase awareness of environmental concerns across broad segments of communities. The clubs have proven to be effective links between a) the school and community and b) the student and parent by virtue of club sponsored community-oriented projects. NGOs such as the World Wildlife Fund, Wildlife Conservation Society and East African Wildlife Society, in their work with Ugandan communities, have historically supported Wildlife Clubs.

Extracurricular school youth programmes of all types are found across all four countries studied. Their effectiveness and sustainability varies widely. The programme development capacity of

organisations involved in this work is often somewhat weak. Research, planning, monitoring, and evaluation skills need to be taught and practised.

### Public Sector Extension Education Systems

The objectives of public sector extension education systems are wide ranging e.g. awareness building via mass media, knowledge and skills transfer through training workshops and demonstrations, technology diffusion through opinion leaders and community organisations. Like continuing education, extension programmes are generally mounted in response to a pre-defined need. The need may be identified and dealt with in a top-down fashion or in a more participatory way.

Historically, when speaking of public sector extension, one was often referring to agriculture support systems comprised of research, education and field-based staff. Yet, ministries (by various names) handling environment portfolios and their associated departments (e.g., natural resources, forestry and/or wildlife) often operate through a similar type of system. To varying degrees, this is the case in the four countries studied. In these cases, extension activities are often defined by the boundaries of a watershed or the peripheries of parks and much development communication often takes place via various types of village conservation committees. Village meetings and demonstrations are commonly perceived as effective teaching methods; peers, friends and radio are commonly perceived to be important channels.

General constraints applicable across the four countries studied relate to the need for those involved with extension activity to:

- a) better target their efforts and messages to specific audiences so as to achieve higher levels of effectiveness and efficiency;
- b) become more familiar with the activities of all parties practising EE&C, including the content of formal environmental education curriculum, so as to achieve higher levels of cooperation and collaboration; and
- c) shift away from top-down strategies and become versed in participatory methods given the important focus on community approaches to sustainable development.

### Multi-Media Social Marketing Campaigns

As defined earlier, social marketing campaigns generally deal with critical issues, seek changes in specific behaviours and advocate specific messages. Across the four countries studied, this highly targeted style of EE&C was rarely practised. In some cases there appeared to be resistance to the idea of targeted advocacy. In these cases it was felt that more objective messages would allow recipients the freedom to choose the attitudes and behaviours best suited to their needs. A misunderstanding was evident - with social marketing, messages are targeted based on defined audience needs as determined by formative research and recipients have a choice to buy or not buy the messages promoted.

Social marketing methods, though a relatively new concept in the environmental arena, have been commonly practised in the health sector for some time (e.g. disease prevention, family planning) and have proven effective in engineering changes in targeted behaviours. Social marketing is characterised by intensive formative research, audience segmentation, programmes formulated based on the concept of perceived costs and benefits, and constant monitoring and adjustment of programme strategies. Furthermore, the methodology often relies heavily on the use of mass media. Audience segments can be primary audiences (e.g. the family), secondary audiences (e.g. suppliers of support services), and/or tertiary audiences (e.g. policy makers).

In The Gambia, the Ministry of Health and the non-governmental Family Planning Association have solid social marketing experience and years of data on what works for who, how and why. Over the years social science research capability has been developed by the Foundation for Research for Women's Health and Production and by the government's Women's Bureau. In addition, the capacity for media support by the government's Public Information Unit has grown. This unit which services both public and private sector clients, runs Radio Gambia, a press and publication section, and an audio-visual unit including mobil video. The capacity exists in The Gambia for environmental social marketing.

The other countries studied have varying degrees

of social marketing and media capability; again, primarily based on work in the health sector. Uganda represents a similar situation with the Ministry of Information and two private sector firms, Media Consultants Ltd. and Bakayimbira Dramactors, playing a lead media support role. In Madagascar, a parastatal public relations agency (CIDST) does media support for government policies frequently utilising seven, higher frequency, centralised radio stations. In Namibia, most mediated promotion, as with Madagascar, is primarily via centralised radio.

Just as there are circumstances that demand objective types of EE&C that teach people to think critically and determine their own behaviours, there are often circumstances that demand more targeted types of EE&C approaches. These more targeted strategies can promote immediate changes in primary audience behaviours in response to acute environmental issues and/or promote behaviour change in secondary and tertiary audiences that are a pre-determined need. There is need to build research and programme development capacity within the public and private sector to support social marketing capability. Of the four countries studied, little social science research capacity was found outside university confines. Regarding media support for these activities, there is a need to

- a) develop lower frequency, decentralised radio that can carry a more targeted and localised message,
- b) support local drama groups effective in staging social issues messages, and
- c) piggy-back on the growing popularity of local video mini-theatres and use them to show promotional clips prior to the main attraction.

### COMMUNITY BASED EE&C

Community-based EE&C refers to education and communication methods that are fundamentally participatory. The objective is to equip and empower communities to sustainably manage their own natural resource base. An ecosystem approach that tries to integrate economic and ecological concerns is generally followed. Efforts are generally expended to teach organisational and programme planning skills. This type of EE&C is

frequently supported by local and international NGOs working in consort with community development committees and is often framed by the borders of a watershed or peripheries of national parks.

The Gambia Ministry of Agriculture's Soil and Water Unit effectively organises its multi-village farmland conservation activities around conservation districts defined by watershed borders. From an NGO perspective, the Chimpanzee Rehabilitation Project works with villages on the periphery of the River Gambia National Park and Action AID concentrates their activity in the Lower River Division. All groups employ participatory methodologies in their work.

In Namibia a community-based management approach to natural resource conservation has been supported by German and American donors (GTZ-SARDEP project/USAID-LIFE project) and by the Nyae-Nyae Foundation. These efforts have addressed issues pertaining to rangeland, forest, wildlife and/or water resources. Fundamental assistance is initially offered in the development of community management committees. These committees later facilitate the development of self-governance concepts, decision-making/problem-solving skills, sustainable management of resources and income generating activities. Both the Ministry of Agriculture, Water and Rural Development and the Ministry of Environment and Tourism are cognisant of the need to share lessons learned from these participatory efforts with their extension staff who have more traditional views.

In recent years, the Uganda National Park system expanded from three to ten parks and work with communities in the buffer zones of these parks became an important focus. NGO and community collaboration have become the vector for much of this work. The Wildlife Conservation Society works with communities in the buffer zone of Kibale Forest National Park assisting with the development of ecotourism opportunities and outreach activities for teachers and students. The World Wide Fund for Nature works with communities in the buffer zone of Rwenzori Mountains National Park to curb threats to the natural resource base that stem from cultivation, hunting, grazing and fuelwood collection. A portion of the revenue obtained from the park is

used to support community-initiated programmes. The use of these funds is coordinated by community-based Park Management Action Committees (PMACs). The Africa Wildlife Foundation's work with communities in the buffer zone of Lake Mburo National Park; CARE's work with communities at Bwindi National Park and at Mghinga National Park; and IUCN's (The World Conservation Union) work with communities at Kibale, Semliki and Mount Elgon are very much like that at Rwenzori, where local governing committees serve to facilitate programme planning and revenue sharing.

In Madagascar a specific parastatal organisation, The Madagascar National Association for the Management of Protected Areas (ANGAP), has been set up to coordinate integrated conservation development projects (ICDPs) supported by NGOs such as CARE, World Wildlife Fund, Wildlife Conservation Society, Conservation International, Volunteers in Technical Assistance, Duke and North Carolina State Universities. ICDPs are similar in concept to Ugandan buffer zone work in that a focus on sustainable development within an ecosystem via participatory methods is followed. The institution of ANGAP needs strengthening. EE&C methods, particularly participatory methodologies, a relatively new and somewhat divergent concept from past top-down approaches, need to be taught and programme planning, research and evaluation capacity needs to be developed. At present each ICDP tends to address its own EE&C needs in a vacuum. Few resources or lessons learned are shared. A strengthened ANGAP could facilitate coordination and increase efficiency and effectiveness of effort.

The situation and needs of ANGAP can be interpreted as a generalised need across all four countries studied. Participatory methodologies that equip and empower communities are new to many. The integration of economic and ecological concerns is often contentious. Communities often need assistance in dealing with these dilemmas. NGOs, the principal vectors for this assistance, need EE&C training for their staff in participatory methods, self-governance concepts, decision-making, problem-solving, conflict resolution, formative research, programme planning and evaluation techniques, revenue sharing procedures, income generating activities and ways of

mobilising external support for selected initiatives.

## INTERPRETIVE EE&C

Interpretation as a form of EE&C pertains to activities of national parks, forest and wildlife reserves that support education/entertainment for visitors (e.g. publications, displays, maps, guide books, trails markers, lectures). The objectives of such activities, often described as "awareness raising", are generally very broad. However, broad-based interpretation activities may be linked to more specific community-based efforts. As discussed above, revenue that is generated by park admission fees can sometimes be used to fund community-based EE&C development initiatives. The sophistication of interpretive activities offered by a park generally dictates the extent to which revenue sharing with communities is possible. The more sophisticated the interpretation activities, the more likely income can be diverted to assist specific community initiatives.

Pertaining to both ongoing and planned EE&C activity across the four countries studied, it was found that Uganda, because of a recent national focus, has the most ambitious plans for interpretive EE&C. The Uganda National Park system, now consisting of ten parks, employs staff that conduct one of three functions - enforcement (anti poaching), community extension (i.e. development in buffer zones) and interpretation. Interpretation activities primarily consist of guided nature walks, lectures and displays. Audiences include foreign tourists, local visitors and school groups. Revenue collected from much of this activity provides partial funding for community development projects.

The status of interpretive EE&C in Namibia is somewhat different. The park system is not as extensive as in Uganda and though the few parks are well visited, the connection with surrounding communities has not been well developed. For the most part, interpretation activities in the country take place at two interpretive centers run by the Ministry of Environment and Tourism. One is located at Etosha National Park; the other at Waterberg National Park. Both centers accommodate overnight stays. Audiences include students, teachers and youth clubs. Game view

astronomy, ecology and plant identification are common activities.

Like Namibia, in The Gambia and Madagascar, past EE&C development priorities did not highlight interpretation methods - perhaps because of the associated "soft" objectives (i.e. awareness raising). Yet, as represented by ongoing Ugandan activities, interpretive EE&C can be used as a vehicle for supporting community-based EE&C activities possessing more relevant objectives (i.e. changes in needed skills and practices). The allocation of future resources to support interpretive EE&C in these countries will probably depend on the revenue sharing policies of their park systems.

## EE&C ISSUES

Opportunities for EE&C exist across the four countries studied. In The Gambia, a National Environmental Agency has been set up and is actively working to achieve synergy of effort among those doing EE&C. Similarly, in Namibia, the present focus is on co-ordination and collaboration among the many excellent public and private sector groups. Uganda could be no less dynamic as it works to define original approaches to EE&C. Madagascar is evolving as a case study in how EE&C can be employed to rationalise economic and ecological interests. Yet, environmental problems are often not obvious. Economic hardship are. Incentives for supporting environmental issues are therefore frequently difficult to define. Past protectionist strategies have generated resistance and exacerbate this dilemma. Though EE&C is a vital strategy in overcoming these issues, it is universally the weakest component of a nation's environmental programme. Critical issues for strengthening EE&C, common to the four countries studied, are discussed below.

Coordination among all players and all types of EE&C is essential. Varying definitions of EE&C exist and different people do it and for different reasons. Issues address agriculture, biodiversity, health, population, ecotourism and literacy. Methods include formal, nonformal, community-based and interpretive strategies. Ministries, schools, NGOs, national parks and community

organisations do it. Youth, adults, community groups and policy makers serve as audiences. Activities for the most part are very individualistic across this myriad of effort. A shared understanding of EE&C, what is practised, by whom and for what reasons, is needed to achieve higher levels of efficiency and effectiveness. Examples of co-ordination do exist but much more is needed so that duplication can be decreased, collaboration increased, coverage of EE&C expanded, efforts of newcomers facilitated, funding facilitated and the frequency and quality of professional development activities improved.

Private sector initiatives are integral to sustainable development. The capacity of local NGOs is, however, often very limited. In addition, there is a tendency for individual NGOs to take on too many issues (e.g. agriculture, health, literacy, income generation, environment). Capacity needs to be built up so that the EE&C efforts of NGOs can be better defined and focused.

Greater capacity for designing and implementing development programmes is needed among groups doing EE&C. Programme development in all four EE&C areas (i.e. formal, nonformal, social marketing, interpretation) can be viewed as an iterative process of formative research and analysis; planning; developing, pre-testing, and refining concepts; and implementation and monitoring (adapted from Novelli, 1984). Across the four EE&C areas, four countries studied, and the ministries, schools, NGOs, national parks and community organisations doing EE&C, it was found that skills pertaining to each stage of the process needed strengthening. Formative research, pre-testing and monitoring capabilities were especially weak.

For the most part an adequate mix of instructional media exists. However, instructional and promotional materials are dispersed and few are adequately researched, tested and evaluated. There is a need for resource centers to facilitate planning, production and exchange among public and private sector groups across most forms of EE&C, perhaps via multi-agency coordinating committees. There is also a general need to develop low frequency decentralised radio to ensure grassroots programming, to work with village level video theatres to include pre-show promotional clips, and



to encourage the use of traditional media.

Because of the close association between environmental issues and agricultural development, and the known gender biases inherent in much past agricultural work, it can be expected that a special focus on gender issues is warranted across all manner of EE&C. Additionally, because formative research has been weak and many issues have gone unaddressed, there is a tendency for societal biases to proliferate. There is a need to look more closely at how competing interests for women's time affect message access and at how biases inherent in message content prejudice their relevance.

Concerning formal EE&C, integration of environmental issues within all subjects and coordination across various curricula is required. Teacher training to support these efforts needs to be bolstered. Pre-testing, systematic monitoring and evaluation of curricula and instructional materials also needs to be instituted. In addition, private sector support of formal EE&C initiatives requires that NGOs become familiar with established curricula so as to optimise the efficiency and effectiveness of their efforts.

Continuing education programmes are especially important for reaching adults and the high percentage of out-of-school youth found in most developing countries. Literacy programmes are especially promising vehicles for environmental and civic education issues. Individual literacy instructors can be trained to blend literacy training with empowerment objectives and civic education in their own communities. Coordination among public and private sector agencies, programme development and implementation capacity, instructional materials development and gender issues are associated concerns.

The viability of extracurricular youth programmes as a complement to in-school activities and a platform for more applied learning, is very strong. Demonstration sites, contests and eco-clubs provide an effective channel for private sector EE&C support of youth. Eco-clubs can also provide an especially effective link between the school and community by virtue of club sponsored community based projects. This can also serve as a vector for the continuing education of parents. Public/private sector coordination, programme development and

evaluation capacity are areas that need strengthening.

Public sector extension has great potential as a form of EE&C if income generating objectives can be more closely aligned with environmental objectives. Extension activities could prove an effective complement to community based participatory EE&C strategies. Extension staff must become aware of lessons learned from community-based EE&C and be trained in 'bottom-up' participatory methods that can help communities rationalise economic and ecological concerns.

There is often a need for a) decision makers and community members to direct their behaviours to solving acute environmental problems, b) decision makers to act on the environmental concerns of their constituents and c) media gate keepers and press agents to provide coverage for environmental concerns. These are three examples of a need for specific action. Social marketing techniques that seek changes in behaviour, advocate specific messages and target specific audiences need to be learned by public and private groups concerned with engineering actions of this sort. Lessons learned from social marketing experiences in the health sector may prove helpful. Empirical knowledge of primary, secondary and tertiary audience socio-economic, psychological and structural factors and information on indigenous research and media capabilities can be shared.

Given that an ecosystem approach that strives to rationalise community economic and ecological concerns and relies on community participation and empowerment strategies to do so is a key to solving many environmental problems, integrated conservation development projects and work with communities in watersheds or buffer zones of parks deserves conscientious attention. Traditional 'top-down' development strategies need to be dropped and participatory methods need to be learned and adopted by sponsoring agencies. Co-ordination among public and private sector agencies, programme development and implementation capacity, and gender issues are relevant concerns.

Pertaining to interpretive EE&C, the development of interpretive centers at parks can serve to increase awareness and appreciation of

environmental issues among visitors. In addition, revenue sharing procedures instituted with buffer zone communities can a) provide incentives for respecting park conservation goals, b) provide support for community-initiated programmes and c) provide support for the outreach activities of park extension staff.

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## NOTES

1. USAID is the United States Agency for International Development.