TEACHING CONSERVATION

Proceedings of a Seminar on Teaching Conservation Overseas

Edited by
Simon Albrecht and Janet Seeley

CAMBRIDGE AFRICAN MONOGRAPHS 7

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This volume contains papers presented at a seminar sponsored by the Centre, ICBP and CEE in September 1986 on 'Teaching Conservation Overseas'.

J.B. Sender
Director

Cover picture: Children from Nairobi school boarding Wildlife Education bus for tour around Nairobi National Park. Credit: Mark Boulton/ICCE.

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Preface

I remember feeling very uncertain about holding a seminar to try and encourage or improve the conservation content of examination syllabuses studied by overseas candidates. Although the new GCSE syllabuses are encouraging, isn't it arrogant when we still have a long way to go with syllabuses in the UK? Further, I questioned our right to try and influence what children in other countries are taught. What seems desirable to us here in Britain could quite easily be inappropriate in Belize, West Africa or the Far East.

We decided to go ahead because, whether we like it or not, examination syllabuses in many overseas countries are still set by UK examinations boards. Even where local syndicates now set their own syllabuses and examinations, they frequently look to the UK boards for assistance. However, a major incentive was provided by the GCSE examinations in the UK. Some of the overseas 'O'level customers still want this examination and this provided a wonderful opportunity to rewrite them especially for overseas customers. These syllabuses were being revised at the time and we therefore wanted to make an input, particularly into the biological and environmental syllabuses.

When we planned the seminar we recognised the difficulties and hence involved a number of people with overseas teaching experience. We did not want to tell the boards what they should include in their syllabuses; the aim was rather to establish ourselves as a resource for the examination boards when they revise their syllabuses. We were asking the boards to consider our discussion of conservation and the role it might play in effective teaching, and to use our expertise through their normal consultancy channels.

This report is the proceedings of that day. The seminar was well attended and there were many interesting and valuable contributions that will influence our thinking in the future.

Since the meeting, some practical progress has been made with some syllabuses already being revised. We hope that, as more are revised as part of their five yearly cycle, conservation interests will be taken into account.

I should like to express my thanks to Simon Albrecht and Michael Rands who were responsible for organising and administering the seminar.

John Baines
Director
Council for Environmental Education

Acknowledgements

We are grateful to the many people who have been involved in the organisation of the Seminar and the production of these proceedings. We would like particularly to thank the British Section of the International Council for Bird Preservation for a grant for the Seminar, and the British Council for their help in funding speakers. We are grateful to the sponsors – the African Studies Centre, Cambridge; the Council for Environmental Education; and the International Council for Bird Preservation – for encouragement and adminstrative assistance. We are indebted to the speakers both for their contributions and for their rapid production of the papers. We are grateful to the participants without whom the seminar would not have been possible. We also wish to thank John Baines for his skillful Chairmanship, Mike Rands for his efficient organisation, and Paul Goriup for his hard work initiating the Seminar. Finally, we are grateful to Joyce Leverett, Bobbie Coe, and Ludgard De Decker for assistance with the typing of the text and Bruce Godfrey and the staff of the University of Cambridge Computer Print Room for the reproduction of the volume.

Simon Albrecht and Janet Seeley

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Introduction

Simon Albrecht[1]

In the spring of 1985 a conference was held in Cambridge on tropical forest birds[2] which highlighted the enormous destruction of natural resources taking place daily in the tropics. At the end of the conference an informal meeting posed the question: 'What should be done to protect tropical forests and their birds?'. Out of this and subsequent discussion the seminar on 'Teaching Conservation Overseas' was conceived.

Conservation is now widely accepted as a major issue in human affairs and one that educators can no longer avoid. Indeed the education departments of organizations like the Royal Society for the Protection of Birds (RSPB) bear witness to the growing demand for conservation material in education. Nevertheless, many of the public examinations set for students in both British and overseas schools barely touch on conservation issues and thus leave students ignorant of a subject important in the modern world.

The objective of this Seminar was to bring together conservationists, teachers and examiners so that each could hear the others' point of view and discuss together ways of improving the conservation content of 'O' and 'A' level examinations particularly those set for students overseas.

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1 12 Hemingford Road, Cambridge CB1 3BZ.

2 'Tropical Forest Birds: Ecology and Conservation' (Cambridge 29-31 March 1985) *Ibis* 128, pp. 163-175.

This report presents the papers delivered at the seminar and develops more fully the ideas and discussion that occurred. For this latter reason the papers are not published in the order in which they were presented during the seminar.[3] In the concluding section of this Report,[4] we have tried to draw out what we consider to be the key ideas presented during the meeting. From them we have drawn certain conclusions concerning the future of conservation in examination syllabuses.

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[3] The order of the papers at the seminar is given in the seminar programme in Appendix 2.

[4] See below pp. 71-78.

Planning for Survival

An Audio-Visual Presentation on the *World Conservation Strategy*

Summarized by Simon Albrecht[1]

This audio-visual presentation, *Planning for Survival*, was used to set the scene for the participants at the seminar. It consisted of a series of slides with a recorded soundtrack – we have summarized its message here because it highlights the central issue which teaching conservation confronts: the survival of our planet.[2]

The presentation starts by showing the world as a single unit in space yet one that is under attack from within through people's careless use of the environment. The *World Conservation Strategy* is presented as a global remedy to the dangers and problems thus created. The *Strategy* has three essential conservation goals. First is the maintenance of the essential ecological processes and life support systems of the planet. Second is the preservation of genetic diversity and the conservation of wild species. Third is to ensure the sustainable use of the natural resources of species and ecosystems. Perhaps the central argument of the *Strategy* is that conservation is essential for economic growth and development. They are not alternatives – either conservation or development – but each is an essential part of the other.

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1 At the seminar this presentation was produced by Mark Boulton, International Centre for Conservation Education, Greenfield House, Guiting Power, Cheltenham, GL54 5TZ.

2 The full text of *Planning for Survival* is available as a booklet from ICCE (see bibliography p. 88).

Planning for Survival contrasts the developed world where 25 per cent of the world's population consume more than 60 per cent of the world's resources with the rest of the world where 35 per cent of the population are so poor that they are forced to destroy the environment that supports them. Ecological processes are the life support systems of the planet. They circulate energy and nutrients and make them available for living things. This happens through the interaction of living things with soil, water, air and sunlight. The ecosystems that do this most efficiently include tropical rain forests, estuaries and wetlands which are under the greatest threat of destruction. Similarly, good farm land is being lost through erosion, poor farming practices and urbanization which further reduces our ability to feed the world's population. Forests, especially those in water catchment areas, and estuaries, on which many important fisheries depend, need protecting. Water and air pollution need greater control and we must change our attitude and practice to the disposal of toxic wastes.

Modern agriculture depends on having a large genetic pool for the production of new varieties and crops and for improving resistance to pests and diseases. An example is afforded by the European wine industry which for over a hundred years has depended on grafting native vines onto American rootstocks to give resistance to insect attack. The American rootstock has a gene (genetic messenger) which gives resistance to the whole plant. Each species has a unique set of genes which are totally lost if the species becomes extinct. The most unlikely living things may be important not only for food but for medicines as well. One way to maintain genetic diversity is to keep 'gene banks' of seeds or microbes but a better way is to conserve key habitats – self sustaining genetic storehouses. In addition trade in endangered species needs to be controlled in order to conserve them.

Sustainable yield is the concept that we take only from nature what we need and we do so in a way that minimises damage and allows the natural processes of growth and regeneration to take place. In practice we have not done this. World fish stocks have been so overfished that we now harvest some 20 million tons less than we might have done – a loss amounting to almost a quarter. Overgrazing and unsuitable farming, exacerbated by drought, have turned approximately 20 million acres of grassy drylands into barren deserts. Overexploitation of whales, minerals and tropical rain forests all illustrate that freedom for an individual to exploit a common resource can ultimately bring ruin to all. The individual may increase her or his gain but the losses are suffered by everyone. The *World Conservation Strategy* lays down broad guidelines for the sustainable exploitation of species and ecosystems.

The *World Conservation Strategy* can be put into effect by integrating conservation principles and objectives with social and economic development. Education plays a key role in transforming attitudes and behaviour towards the conservation of plants and animals as well as people. If this does not happen and we carry on in the same way then we face an environmental catastrophe as great as a nuclear holocaust. There are signs that changes in attitude and action are beginning with the establishment of national parks and laws to protect the environment, but difficult times still lie ahead because our environmental ills are deeply rooted in the social and political realities of our time. Rather than spending money on armaments and nuclear weapons we must curb population growth, improve the living conditions of the poor and distribute the world's wealth more fairly. We must make the rational use of living resources the rule rather than the exception. Only if we recognise that we are dependent on natural systems and must work with them will we avoid a large scale environmental tragedy and come to enjoy belonging on an earth

which remains good because we help to keep it so.

Education – Criteria for Action

Peter Martin[1]

Since its publication in 1980, the *World Conservation Strategy* has provided endless scope for debate about the function of various elements of the environmental movement, no more so than in relation to the role of education in the achievement of conservation goals.

Currently there is justifiable scepticism about the value of these endless debates. This would seem to eminate from the inability of the debaters to convert their rhetoric into practice, and the inability of the practitioners to understand how the new philosophies can be converted into practical activity.

However, both elements are vital, for without clear philosophies it is impossible to construct and evaluate coherent educational activity, and without good practitioners it is impossible to achieve the ambitions of the philosophers.

This paper describes how an education programme, based on the aims of the *World Conservation Strategy*, has been implemented by the World Wildlife Fund in the United Kingdom. It describes the broad philosophies and criteria for action and outlines the component parts of the programme.

It is stressed that the model described has proved effective within the context of the United Kingdom's education and environmental situation. In no

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[1] World Wildlife Fund (UK), Education Department, Panda House, 11-13 Ockford Road, Godalming GU7 1QU.

way does this assume that a similar model would prove effective or appropriate in any other situation or in relation to the aspirations and needs of other organisations. However it is hoped that this description of the philosophies, criteria and strategies employed by World Wildlife Fund (United Kingdom) may give insight and ideas that may prove useful to others who are in the process of developing their own education programmes.

Background

In the United Kingdom, the conservation movement's concern about the environment used to focus on the extinction of species and on habitat damage and loss resulting from urbanisation and agricultural and industrial activity. This concern deepened to include concern for the state of the life support systems of the planet, the health of the ecological systems that support agriculture and industry, and the speed at which non-renewable resources were being depleted.

Reserve acquisition and legislation as a means of protecting wild species and complete habitat types were seen as priority measures to slow down this destruction and to ensure the survival of at least some of the most threatened areas and species. In association with this there have been concerted efforts, through coercion, education or legislation, to influence or force the controllers of land use in industry and agriculture to take on board practices that are less damaging to the environment, and to be more circumspect in the use of non-renewable resources.

As an adjunct, there was an educational facet operating on the principle that these efforts could be made more effective by public support for

sustainable environmental mismanagement, and support for healthy and stimulating environments in which to live. In this way, education provides a mandate for a general support of the work of conservation organisations, and thus this education facet is subservient to practical conservation practice.

In the main this education process has centred on the following broad and straightforward elements.

1. Dissemination of information on the issues, and the work of the organisations in overcoming them (basically a public relations function that promotes the organisation and its work).

2. Education to encourage more people to become interested in the environment and take an active interest in it, in the hope that the more interested people we have, the more likely they are to support conservation measures.

3. Training programmes for land managers and rangers to implement the policies of the environmental conservationists.

The current 'greening' of political parties, particularly in Europe, the rapid and vast growth of conservation organisations, and the rapid proliferation of reserves all bear witness to the efficacy of this mode of operation.

However, hand-in-hand with this growth of environmental interest and concern there has been an equally large growth of the problems that the environment is facing. As legislation has increased and nature reserves proliferated, and as the mass media pump out the reasons for nature

conservation, the problems continue and in fact get worse with nature reserves becoming increasingly isolated within a highly mechanised and despoiled environment.

The continuing and indeed worsening environmental problems are practical manifestations of the limitations of pre-*World Conservation Strategy* thinking – limitations predicted by various philosophers who proposed amongst other things that.

1. Scientific knowledge and technological sophistication increases the ability of humans to utilise natural resources, and as populations and standards of living rise, the demands for the products of agriculture and industry increase. Thus, the demands on natural resources can only become more intensified and escalate the decrease of diminishing resources.

2. The conservation of natural resources, even with the input of vastly increased funds, can ensure the protection of only a small proportion of the huge diversity of threatened habitats.

3. The concept that the aims of environmental conservation can be best achieved by the setting up of inviolate nature reserves and draconian legislation is both ideologically and practically unsound. Long-term environmental conservation can only come from a groundswell of support from the whole of society, and mismanagement can best be outlawed by a groundswell of social censure.

4. Most of the predicted environmental problems stemming from environmental mismanagement are in the main significant only in the long-term. Therefore, self-interest as a reason for conservation action cannot be enough. Self-interest is only effective for the short term, it will not extend into the future. Therefore, lasting and effective conservation action can only realistically be based on a philosophy which focuses on a vision of humanity and what is a right and sensible way for humanity to behave.

5. Modes of practice that are damaging to the environment, are often motivated by short term economic imperatives or short term personal gain rather than the long-term benefit of people or the environment. Practices that have widespread damaging effects can be instigated and maintained by a small influential minority of individuals or agencies, who may remain impervious to the arguments of the environmentalists.

6. Regardless of how horrific the facts about the likely outcomes of continuing environmental mismanagement are, they are unlikely to cause any effect or response from the general public unless the general public have:

   the necessary sympathy to identify that the issue is a problem;

   the necessary understanding of the real causes of the problems;

   the necessary understanding to accept the real implications of trying to effect a solution;

the ability, understanding and determination to do anything about it.

The *World Conservation Strategy* amplified this thesis and synthesised a solution into a proposition that stated that unless the motivations for human activity are fundamentally altered so that benevolent attitudes to the environment dominate, conservation will remain a rearguard action fighting for a cause that will inevitably be lost. Thus it stated that education must 'change the attitudes and values of whole societies if the long-term aims of conservation are to be achieved'.

The *World Conservation Strategy* calls for an education effort that is not in the business of promoting environmental organisations or environmental activity as an adjunct to the mainstream of social activity. Rather the *World Conservation Strategy* calls for education to direct its effort towards the general acceptance of and allegiance to a philosophy about human life that is not allied to environmental and human degradation. It recommends a philosophy that encompasses a code of behaviour in which environmental care is an integral core to human behaviour and good environmental practice eminates from within this basic, fundamentally caring relationship with the environment, rather than from a practical response to some predicted environmental crisis.

The *World Conservation Strategy* is not preaching a trivial text, it is not preaching a limited or esoteric end product, but it is exploring the very motivations and structures that direct human life, and thus necessitating the development of new and profound modes of education activity designed to achieve these specific social effects.

This support for education as presented by the *World Conservation Strategy* does not assume that the old role for environmental education, regardless of how successful and hard-working it was in the achievement of its most laudable aims, is the correct vehicle for achieving such fundamental effects.

These aspirations necessitate a definition of education that does not perceive it as utilitarian – simply providing young people with the means to acquire and carry out a job – nor as a means of social replication. Instead education is regarded as a liberating process, a process that does not perceive the human condition as anything absolute, but proposes that humans can make the world as they would like it to be, given sufficient will and insight.

Due to these profound aims it is vital that clear philosophies and clear criteria for the production of education programmes are produced against which action and results can be evaluated.

However, education programmes that aim to change attitudes and values present vast problems in this regard. Not only is the assessment of such ephemeral aspects of human psychology difficult, the achievement of attitude change will only become apparent in any significant way in the behaviour of people in the future.

Also, as people will be subjected to a whole array of influences during their lifetime, it is unlikely that any changes noted in their future behaviour can be specifically credited to a particular educational initiative. However, there is much research available on how attitudes are developed and much information concerning the structure and style of educational experiences

necessary to achieve attitudinal change. This information can be used to direct the design and content of educational resources and, once produced, used as pre-determined bench-marks against which programmes of activity can be evaluated.

Criteria for Action

1. Decisions made by central policy makers cannot be easily and effectively operated without general public support – general support for an issue can encourage decision makers to act. Therefore, environmental education that focuses on the development of small cells of natural history interest is not sufficient to achieve the aims of the *World Conservation Strategy*. To achieve the proposed changes, environmental education programmes must address the whole of society.

2. The major problem of the education operations of environmental and development organisations is that they attempt to implement a national and sometimes international impact from outside the system and with very limited resources. To be effective the only way to operate is through and with the systems that carry out education.

3. The education of young people as participators in and controllers of future society must be of paramount importance. Access to such programmes must reach all young people and not solely those who are already practically interested in the environment. Therefore schools, as places where all young people can be reached, must be a prime consideration in the development of environmental education policies.

4. In the past environmental educators have attempted to infiltrate the system via the entertainment ticket, filling in a spare hour, the outside speaker, the school treat, the one-off audio-visual entertainment. The sort of in-depth education experience necessary to achieve the results required by the *World Conservation Strategy* cannot be provided by such brief and incomprehensive encounters with environmental issues. Ensuring that all young people receive adequate environmental education in their schooling can only be realistically achieved by their involvement in long-term and comprehensive education programmes.

5. Attempts to encourage teachers to include an environmental perspective in their teaching without providing them with suitable resources is unlikely to be successful. Thus the education programme should concentrate on the creation of classroom teaching resources and the promotion of their effective use in schools.

6. Schools have teaching procedures that are firmly fixed within well defined structures. In the short term, to achieve maximum use resources must be produced that do not require new slots in the timetable or new teacher skills.

7. The fundamental changes of attitudes and practice recommended by the *World Conservation Strategy* requires an in-depth understanding of the way the world works. Therefore, environmental education programmes need to provide insight into the whole basis of human involvement on this planet. Thus, as well as including resources that investigate the ecological systems necessary to maintain a healthy planet and the problems that human activity causes in relation to these systems,

education programmes also need to investigate the economic, political, social and philosophical structures that direct human behaviour.

8. Each subject in the curriculum reflects an area of human activity and gives insight into the way in which people interact with their world. After thorough investigation of the curriculum, resources can be produced that mobilise what is already being taught, making the best of the skills of specific groups of teachers and the inherent qualities of each subject.

i. The sciences and geo-sciences (biology, geography, chemistry, physics, design/technology and computer studies) can be mobilised to develop an understanding of how the world works practically in terms of life support systems and agricultural and industrial processes, and the effect of human activity on these life support systems.

ii. The humanities (economics, history, home economics, religious studies, social sciences and business studies) can be mobilised to develop an understanding of the different influences on human behaviour and the implications of this behaviour on the environment. Major influences would include different means of social organisation and the political and economic structures that maintain them; the evolution of social organisation; values that control action, and the structures that promote and maintain value systems.

iii. The arts (music, art, English literature) can be mobilised to develop an enriched experience and a critical awareness of personal reactions to the quality of the environment and environmental issues, and a belief in the importance of such personal feelings.

iv. Field studies and outdoor pursuits can be mobilised to develop a personal set of values about the environment via interaction with a range of environmental experiences.

9. Because the aims set for education propose in-depth personal changes, not only is the content important, so too is the method of presentation. Therefore the teaching materials should be presented in a way that engages the intellect of people in active processes of analysis, questioning, discussion and decision making. It should challenge as well as inform. It must not be prescriptive but give young people the necessary insight and competence to make advised judgements about environmental issues. It must engage them so that they begin to take a personal interest in environmental issues and become willing and able to take action.

10. All the teaching materials created need to have credibility in the classroom or teaching equivalent and must be supported by an enthusiasm from within the system. Therefore, the resources must be created by, or in conjunction with education practitioners as well as subject specialists within the systems that will use the resources.

11. In order for this process of resource creation to be effective, there is a need for additional strategies to influence the individuals who carry out education on a day-to-day basis. The uptake of the resources produced depends on the individual teacher's awareness of and sympathy with environmental issues and the necessary professional competence to handle the issues in the classroom. Thus education programmes should include provision for teacher education at both pre and in-service training in conjunction with a programme of materials dissemination.

12. No matter how good the resources and no matter how well motivated the teachers are, or become, unless there is a time and place within the school curriculum for teachers to mobilise their concern, insight and materials, all the efforts of the previous two activities become nullified. The acceptance of environmental education as an integral part of school education, as vital as literacy and numeracy, is ultimately essential if the aims set by the *World Conservation Strategy* are to be achieved. Thus a vital aspect of any education programme should include initiatives to influence decision makers for education policies at a central level.

13. This new approach to environmental education is designed to have a profound influence on education at a fundamental level, it therefore cannot be implemented without the assistance of philosophers and practitioners from the educational, rather than environmental, world. In the development of education programmes educationalists of the highest level must be involved.

14. Education is not apart from society, it does not operate in isolation from the rest of social activity. Thus the perceptions of what education should do, and the perceptions of what constitutes 'the educated person', and thus the content of education are, to a large extent, defined by forces outside education. These include employers, Unions, the media and Governments. To ensure the acceptance of new and radical changes to education, the general acceptance of the need for change within society must be developed through these agencies of influence.

Within these broad criteria the World Wildlife Fund has designed an education programme that covers the four major elements of:

1 Resources The first stage of the education programme has focused on the creation of classroom resources that teachers can use to bring an understanding of environmental issues to the school curriculum.

2 Teacher Education The second phase of the education programme is concerned with the initiation of a programme of research and resource creation to develop a teacher education module. This will be used for in and pre-service teacher education, so that more teachers are environmentally literate, concerned and aware and therefore more likely to take on board the aims, objectives and materials of environmental organisations.

3 Curriculum Influence The third aspect of the World Wildlife Fund's education programme aims to influence decision makers in education to ensure that environmentalism is included as a vital aspect of the school curriculum.

4 Education and Society The fourth facet of the Education programme will focus on the development of a strategy to influence those forces, including such institutions as the media, the church, the government, Unions, employers, parents, which have vested interests in, or perceptions of what education should be and also perceptions of the characteristics that the 'educated person'

should have.

Conservation and Education in Kenya: the local view

John Daudi Achoka[1]

This paper looks at some of the problems encountered by a teacher of conservation in Kenya. It deals particularly with the cultural problems that seem to impede conservation.

The Concept of Conservation

The first problem is one of definition. What is 'conservation'? What should be conserved? There is no universally accepted definition of the term. Indeed, the majority of Kenyans would view the western concept of 'conservation of natural resources' as an imposition of unnecessary constraints upon the use of their land. Traditionally the bond between the people and their environment, with its seemingly inexhaustible resources, has been very strong. People have obtained food, erected shelters and secured medication from the land. The environment has supported large families with many livestock, which not only brought the owner prestige but also provided the family with insurance against the possiblity of extermination in the wake of disease or environmental disaster. In the past there was no concept of 'private property': everything, including the people, belonged to the extended family, the clan. This traditional way of life still persists in many parts of Kenya. However, rapid population growth and changing life-styles increase the pressure on the land

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and conservation measures become necessary. The old way of life is no longer viable. The concept of 'conservation' creates conflict between the authorities and the people because effective conservation campaigns require the use of concepts such as 'private property', 'public property' and 'illegal grazing' – alien terms to many Kenyans.

The task which faces conservation teachers in Africa is to try to explain the new terms and concepts of conservation so that people will understand the rationale behind conservation measures and campaigns and then cooperate in the work of conserving the rapidly dwindling resources of the land.

Conservation of the Concept of Conservation

The idea of conserving resources is not new: the prudent use of the land has enabled many societies to survive and make a living even in marginal areas. Traditionally societies in Kenya taught their members to use their environment wisely; initiation ceremonies, for example, consisted of a period of instruction on the animals to be hunted and those to be avoided because they were sacred or profane. Modern society has no such categorization or instruction. The lessons children learn in classrooms today have very little to do with life outside the school. The problem faced by teachers of conservation is to resolve this conflict of values between the old and the new which bewilders African children. Teachers must instil, once again, a sense of respect and understanding of the environment.

Conservation projects in Africa have often overlooked the traditional conservation values of the people and failed to recognize their knowledge of their own land. Conservation strategies have been imposed from above. It is

not, therefore, surprising that this 'top-down' approach to conservation has met with mixed feelings since the modern education system is very largely influenced by external values and standards.

To farmers, the creation of National Parks and Reserves and Forest Reserves, which displace people into marginal land and squatter status, has had a negative impact upon the credibility of conservation efforts. The fact that in some areas rhinoceros and other animals are protected on vast reserves at the expense of local people for the benefit of some individuals who hunt them for export seems to be incompatible with the general idea of conservation. Such inconsistencies flout the spirit of conservation and could kill it. If conservation is to survive as a viable policy it must be seen to be of benefit to the local people.

Cultural Factors in Conservation

Conservation efforts should be directed towards bettering people's lives. Consequently conservation strategies need to take into account the culture of the people for which they are designed. Social roles hinging on gender differences are more pronounced in some societies than in others. Similarly interaction between youths and adults is more strictly prescribed in some African societies than in others. These are aspects of society to which conservation teachers must be sensitive because there are no activities that are universally set aside for men or women or for the young or the old.

The way in which natural resources are treated and used can also be determined by cultural factors. For instance, cooking practices in Africa tend to be very wasteful, not purposely but through poor design. So in talking about

energy conservation one should also be talking about improved cooking tools. Moreover the introduction of new tools must be in line with the existing practices. In Cameroon, the introduction of solar pans for cooking failed because people there do not make their food until after sunset. In Kenya men are antagonistic to family planning methods because they fear that the women would become 'loose' if they were to use contraception. Therefore, the predicament in which conservation and education find themselves in Kenya today is not that the people are unwilling to accept changes, but the fact that these changes are hastily introduced without leaving enough time for them to be digested and assimilated into traditional and cultural practices.

The Scope of Conservation Education

Conservation education in Kenya at present concentrates on issues central to our national development. The emphasis in the newly commissioned syllabus for diploma teachers' colleges is on conservation of water, soil, energy, vegetation and wildlife, the rationale being that since Kenya's economy depends on agriculture such resources are vital for the future. But besides this, the resources listed above are vital for human survival whether at a commercial level or purely at the level of subsistence. However, the conservation of history and culture is not mentioned, even though conservation out of this context is no conservation at all.

The existing practice is that conservation is taught theoretically, and the only practical work is done by clubs (such as the Wildlife Clubs), the Non-Governmental Organizations (such as KENGO) and the women's groups. In addition there is a burst of conservation activity during the annual tree planting week. Unfortunately at the end of the week all conservation activities cease

and even the projects already under way are left at a standstill; the trees are often not watered and so die.

As it is now, traditional subjects on the school timetables are not used to promote conservation effectively. There is a great disparity in commitment, interest and knowledge among teachers. The impetus for teaching conservation will therefore continue to be absent as long as no really active measures are implemented both by the government and the educational authorities. The curricula planners should rid school subjects of elements that are no longer useful for our children. The other obstacle is the lack of local teaching resource materials to replace the foreign materials now heavily relied upon by the African conservation educators. This therefore calls for well-trained and qualified personnel in the area of conservation. In-service sessions for practising teachers would be used in furthering conservation education. But on the whole, purposeful and correct local feasibility studies, which could form the basis on which appropriate and local conservation models might be built, are long overdue.

Conservation Priorities

What is viewed to be worthy of conservation will vary from society to society. Some Africans are economically dependent upon the land, others are dependent upon animals. The former may be prepared to undertake the challenges of conserving the soil, whereas the latter would be more concerned with the well-being of the cattle, camels, sheep and goats and the conservation of adequate pasture. Conservation strategies cannot, therefore, be uniform; they must take into account the economy of the society and the nature of the resources upon which the people depend.

Conclusion

It is important to assert that conservation in Africa is still in an embryonic stage. More needs to be done and must be done in order to give it the relevance it desperately requires. The blending of proven facts and popular beliefs is vital for the survival of conservation and its growth in education.

Conservation Education

in the East African Secondary School

Stephen P. Tomkins[1]

The giving of a paper on the subject of conservation education in a country other than one's own is a dangerous and even impudent thing to do. No expatriate really sees the national realities nor has to live with the consequences of facing up to them. My credentials for contributing are principally as a secondary teacher of biology and as a teacher trainer in East Africa from 1965 until 1972 with only one subsequent visit in 1979 as part of an environmental education programme. I have also been a contributor to the East African School Science Project (SSP BIOLOGY), been involved in the founding of the Wildlife Clubs of Uganda, and more recently acting as a consultant on one New Kenya Certificate of Education publication in Biology.

The present state of conservation Education in East Africa cannot be viewed outside of the context of recent African history. Colonialism and now neocolonialism have been part of the picture for a long time and are not unrelated to the organisation of this seminar. The wealthy western white sees wildlife, species diversity and abundance with very different eyes from the poorly-off peasant farmer. If we ourselves were without Government health and pension schemes and lacked clean water, cheap electricity and a sewerage system, had seven children as a security system to ensure our survival at all

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and then had to put up with the ravages of crop pests and disease our understanding and conception of today's need for conservation would be different. On the one hand we should not be surprised at the behaviour of people in contemporary Africa for it was after all Cecil Rhodes who said that 'expansion is everything'! On the other hand we should be sufficiently culturally aware that it is peculiarly British, perhaps, to think that we have the solution to the Third World's conservation education problems. Education should begin with where people are, not necessarily with where we decide they should go. To think otherwise is to misunderstand the aims of education. Syllabuses fit into this picture, but they do not lead events quite as much as we might wish them to do. Putting something in a syllabus does not change the fundamentals of human behaviour very quickly or alter the realities of human ecology in countries at present very different from our own. These remarks may seem beside the point but I believe them to be fundamental to the proceedings of this meeting.

Secondary Education has a long and distinguished history in East Africa. Standards of teaching in the best of East African secondary schools has been on a par with that in the United Kingdom for over half a century. The historical pattern of development is well shown by Makerere, in Uganda, which began as a secondary school in the thirties and upgraded itself to a University College, with London external degrees, in the post war years. It developed its own faculty of education which in the colonial era provided the greatest outlet for young men and women of talent. Expatriate teachers from the United Kingdom saw their role as the education of a black elite to take over the reigns of power. The biology curriculum was centred on the school certificate syllabuses from London and Cambridge. Floral biology and the internal organs of the rabbit were taught at Makerere as at Manchester

Grammar School. The lack of bluebells and buttercups was no handicap for the zealous overseas candidate who learned to draw their half-flower diagrams faithfully from United Kingdom published text books. I recall a Malawian student at Cambridge in 1962 who told me of his excitement when seeing these flowers for the first time. There was little mention of ecology or of conservation in contemporary biology teaching. Secondary education at this period was regarded as a necessary hurdle and means of escape from a bare-footed childhood in the bush which would lead to a life-style modelled very largely on the ways of the colonial power.

By the early 1960s the first mention of ecology came into the overseas O and A level syllabuses. All was not well, however, in terms of balance in the teaching of biology for there were still set dissections of imported British earthworms and little realisation of the need to relate curricular content to national needs. At certain times in the development of school curricula there are periods of intense disquiet with syllabuses and hence pressures for their radical alteration. Although syllabuses may be powerful instruments of change they may also be remarkably impotent. Teachers are often very chained to their content. On the credit side this does ensure that a topic is taught but on the negative side it does not guarantee that that topic is taught well or in its best context. Syllabuses of course also evolve more slowly under pressure from teachers and those in higher education, but it is a slow evolution and one conservative of tried and tested inclusions. The classical mix for a biology syllabus has for long been such things as the characteristics of living things, the cell, biochemistry, the range of living organisms, plant physiology, animal physiology and genetics. Into the matrix new items are popped whilst elsewhere other things are dropped out. Cell biology, cell ultrastructure and biochemistry have grown, out of proportion to their practical classroom

investigation, whilst evolution and ecology have been tacked on at the end. The appendage of evolution and ecology to the tail end of biology syllabuses has actually dictated to a large extent the sequence of teaching - crammed in at the end of the course against the constraints of curricular time in too short a while before the final examination. It is into such a tightly packed box of bricks that we seek to jam in some mention of conservation in the faith that it will work some magic on human behaviour.

In the mid 1960s ecology was a set syllabus component of the Cambridge overseas O level Biology only. A 'study of one natural environment with respect to its biotic and physical factors' was set. I can well recall taking classes of over forty to a field site by means of two journeys in the vehicles of expatriate teaching staff. The wildlife of the brick-pit we visited was fantastic for the children, the pond dipping was a new experience and the wonder of finding a new environment for the first time was manifest. It was a real biological education but 'conservation' was not a word we employed in our teaching.

By the early 1970s things were different. Men had been to the moon and looked back at the lonely 'Spaceship Earth'. For the first time in the West the limits to growth were perceived, expansion was not 'everything' anymore. This environmental concern of the rich white west was quickly recognised and acted on in East Africa. Game conservation had been a legislative priority since the Second World War and in Uganda already three National Parks were developed. In 1971 and 1972 Uganda prepared a report for the Stockholm Conference on the Human Environment, a Report which at that time was an

outstanding example of forward planning in a Third World country.[2] It was compiled largely by William Banage, the first Ugandan professor of zoology at Makerere and, briefly at that time, Minister of Animal Industry Game and Fisheries. It is worth looking at the vision of this document though it came to little in practice because of the ensuing decade of civil war. In the section on Environmental Education, Banage points out the problems as then understood:

> Lack of proper education makes the majority of Ugandans unable to perceive the problems and assets of the environment. This is a reflection on the type of curricula which we have in schools which in many respects have not been relevant to the country's situation. ... One of the effects of the introduction of a 'western' type of education and culture has been the assumption that the 'western' systems of classification and usage of the environment are better than traditional ones. ... Traditional education was closely related to the necessity for gaining detailed knowledge of the natural environment. This knowledge, although based upon systems of classification different from those of western science, led inevitably to respect for the environment and its potential, and hence its conservation. As in all kinds of societies and in all historical periods, there was some 'abuse' of the environment occasioned by certain practices. In Uganda, as elsewhere, western education has led to the rapid disappearance of traditional systems of classification and management of the environment and related ideas of utilisation, without replacing these with more stable alternatives acceptable to the general population. Thus increasing ignorance of the environment leads to its disrespect and misuse...

Banage goes on to point out how the use of the mass media, the press, radio and television must be employed to disseminate information on the environment, commenting that before people will act they need to be encouraged by those in their community whom they know and respect. Banage cites the health and agricultural extension services as achieving their success

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[2] Republic of Uganda *National Report on the Human Environment* (Kampala, 1972).

through the adoption of new methods by an educated rural elite.

By 1972 the Wildlife Clubs of Kenya were established and the Wildlife Clubs of Uganda followed them with equivalent success. Funded by the African Wildlife Leadership Foundation, mostly from the USA, these organisations have since that date set up a secondary school club structure with powerful resources and media for communicating the conservation message. Their work has had a considerable impact but legitimate concern has been expressed about the depth of commitment it may involve in the minds of the young. Is such pushing of resources from the West a missionary evangelism that will sustain a real faith in the conservation ethic for the future?

In the East African Secondary School in the late 1960s and early 1970s a science teaching revolution took place following the Nuffield Science Teaching programmes in the United Kingdom. The School Science Project (SSP) made much of teaching science by the experimental method and, quite rightly, method took precedence over syllabus content at that time.[3] There was a strong course emphasis now on the kind of practical ecology that is related to agriculture. It was hard to make such work seem important when the prevailing ethos amongst the young (and their parents) was that education provided a route away from anything looking remotely like an enslavement to peasant agriculture.

In the fourth year course of SSP Biology there was for the first time in all schools an experimental treatment of animal populations and ecological

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[3] *SSP Biology*, Books 1 and 2: Institute of Education, Dar es Salaam; Book 3: Institute of Education, Makerere University, Kampala; Book 4: Kenya Institute of Education, Nairobi.

equilibria. Data handling was introduced as a learning method. By extension, the principles of ecology were applied to the human population. The books had an emphasis for the first time on forest and wildlife conservation and the value to the economy of wildlife was stressed. Wild plants and animals were seen as genetic resources of value and there was ample emphasis on their importance for such things as medicinal use. Environmental pollution of air and water were discussed quite fully and were ahead of their contemporary secondary publications in the United Kingdom. It is thus over fifteen years since a great variety of conservation issues have been part of the secondary curriculum in East Africa. To some extent the infrastructure of all this was shaky, the books themselves were expensive and the inservice teacher training requirement was very great. By the late 1970s the standard of biological education of this kind was beginning to fall in the now very large number of schools. This collapse must be seen, however, against the move away from elitism and towards a more universal secondary education. Despite this the elite schools are still found and the present syllabuses have by no means lost the momentum of that environmental reformation.

After a decade of warfare in Uganda, the national school certificate in Biology is still riding high. It closely mirrors its Cambridge 550 syllabus counterpart and does have a solid section on ecology.[4] A reference is made to organochlorine pesticides affecting bird populations and there is a passing aside on soil conservation. The SSP syllabus still continues and has a larger section on Man and Natural Resources, but it is still poorly spelt out for the average teacher.

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[4] Uganda Examinations Council *Biological Sciences Syllabuses, Uganda Certificate of Education* (Kampala, 1983).

Both of these indigenous syllabuses will be undergoing revision in the near future to follow along the lines of the GCSE in the United Kingdom. The Uganda syllabus in Agriculture (1983) is devoid of any reference to conservation other than the control of soil erosion. It is worth noting that this is also true of the exported Cambridge syllabus and the latest International GCSE for 1988.[5] It is a pity that these syllabuses do not reflect the revolution in attitudes to conservation that now pertains in British agricultural colleges. The most recent Biological Sciences syllabus from the Kenyan Certificate of Secondary Education was published last year.[6] This is for a new examination aimed at the fifteen to eighteen age group and modelled in part on the GCSE criteria used in the United Kingdom. Conservation is firmly enshrined in the general objectives of this new examination. It has a major ecology section in which forest and wildlife conservation methods are specified as ones that should be known, with mention of pollution, deforestation, soil erosion and natural resource conservation. An ecological study is specified and a visit to a National Park required. This new Kenyan syllabus is radical in its objectives but it is certainly not adequate in the definition of needs for the conservation of rare species, or of threatened communities, of genetic resources, of plants with potential for food and medicinal value or even for the economic aspects of tourism. However, in all fairness it must be stated that there is more here than in any comparable United Kingdom syllabus. East Africa is no by means 'backward' in its syllabus content. It is we, in the United Kingdom, that need to put our own house in order.

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5 University of Cambridge Local Examinations Syndicate: *Examination Syllabuses in Biological Sciences* published annually; *International Examinations* published in 1986 for 1988; *International GCSE* published in 1986 for 1988.

6 Kenya Examinations Council *Biological Sciences Syllabuses, Kenya Certificate of Secondary Education* (Nairobi, 1985).

Where does this leave those of us who are concerned for conservation in the Third World? I am convinced that to press for a greater emphasis on conservation in examination syllabuses is right, but this will change very little by itself. Those of us in the conservation movement who are in a real panic about the very survival of species (particularly those species threatened by habitat loss for which special programmes of species conservation just cannot be afforded) have got some hard thinking to do. Certainly the peasant who is cutting down those remaining forest refuges is the proximal cause but not the reason for the problem. Such people know more of natural resource conservation than the average westernised farmer and many studies have shown such peasant farmers to be unable to behave in any other way than the way they do towards their environment. In short, they are caught in an altogether larger crisis in human ecology. When it comes to exploitive behaviour on this planet western society has not got a leg to stand on. The conservation movement needs to put its back into the Third World development movement. More will be achieved by raising the status of farmers, by raising their food prices and incomes within their national economies than by conniving at their poverty, which is often what conservationists are perceived by their critics to be doing. This was radically spelled out in the *World Conservation Strategy* five years ago.[7] What have we been doing in the interim?! The human predicament in Africa and the environmental losses have both become worse. Good agricultural practice can rescue much environmental degradation, raise yields and make countries like Uganda net food exporters. A more wealthy and healthy population perceiving the benefits of smaller family size will be more able to put the brakes on habitat destruction. Conservation education could go ahead with other rural

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[7] International Union for the Conservation of Nature and Natural Resources *World Conservation Strategy* (Gland, Switzerland, IUCN, 1980).

extension services such as those for agriculture, literacy and health. This has been shown splendidly by the Mountain Gorilla Project in Rwanda and Uganda, a scheme that has involved all the local communities in developing an awareness of what they; hold in Trust for the World.

In the last analysis education is about values and not syllabuses. The conservation ethic is probably something deep in the human spirit and perhaps most easily rediscovered by those who have the leisure to contemplate the world they live in and who don't have their backs to the wall. In the process of education, school activities and situations which are samples of the values a society wishes to encourage are the ones that will succeed. Conservation fits into this context. We need to nourish the teachers and their schools so that such values may grow.

Perspectives on Conservation

in Public Examination Syllabuses (1)

Mike Witherick[1]

The intention of this paper is to make some rather general observations about the interrelationships of three critical components - the examination board, the published syllabus and the curriculum. Some understanding of the ways in which these three interact is crucial to the success of any campaign that might be mounted to bring about change in the classroom, as in this instance, to enhance the teaching of conservation. The points to be made are admittedly elemental and somewhat disparate, but they are perhaps best covered by treating them under the three headings of current realities, influencing the syllabus, and cautionary notes.

Current Realities

Opportunities - lost and new

The first point arises from the opening paragraph of the discussion paper (see Appendix 1, p. 79) circulated in advance of the seminar. In that paragraph, there is mention of the great potential that now exists for teaching the principles of conservation to those students in tropical countries who take British O and A level examinations. That note of optimism does need to be

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qualified. The fact of the matter is that much opportunity has already been lost, because the numbers overseas taking British board examinations has greatly diminished since the early 1970s. For example, 10 years ago the number of overseas candidates taking the University of London School Examinations Board's O and A level geography syllabus was measured in tens of thousands; today there are scarcely thousands. What has happened is that many Commonwealth countries, such as Brunei, Hong Kong, Malaysia, Nigeria, Singapore and Zimbabwe, have gradually declared independence in the context of public examinations; they have set up their own boards and now operate their own syllabuses. Thus the opportunity for us here in Britain to influence what is taught and examined overseas has already considerably diminished.

But all is not lost, there still remain some lines of influence. For example, a number of these new overseas examining boards do ask British boards to assist them in a number of ways, be it in the design and approval of syllabuses, in the moderation of examination papers, in the verification of marking and examination standards, or in the provision of workshops for local examiners and teachers. It would be fair to state that the Cambridge Local Examinations Syndicate appears to be the current market leader in this particular field, for undoubtedly over the last few years it has taken positive steps to reassert itself in what it now perceives to be a lucrative overseas market. It would seem that Cambridge has expanded its sphere of activity as other boards, perhaps with a sigh of relief, have withdrawn from overseas commitments. It has to be said, on the basis of firsthand involvement in the University of London School Examination Board's effort to assist the Cameroon Republic in setting up its own examination board and examining machine, that such overseas commitments are frequently fraught with

difficulties, frustrations and an occasional concern that perhaps matters are not being conducted with the same rigour and impartiality as at home.

Whilst these references to lost opportunities and practical difficulties may sound a trifle too defeatist, the Cambridge Local Examination Syndicate's relatively recent and apparently successful overseas drive afford some grounds for cautious optimism; that drive has revealed that there are still chances for us to influence matters overseas. Furthermore, one might make the important point that as Britain moves from O level and CSE to GCSE, so two of the British boards (Cambridge Local Examination Syndicate and University of London School Examination Board) have entered into agreements with a number of countries to continue to offer an overseas O level examination. Now that is significant, for surely it creates the opportunity to revise those syllabuses with the overseas candidate specifically in mind, rather than insisting that those candidates do exactly what British students do. In this new scenario, it should be possible, in appropriate mainstream subjects, not only to introduce more elements of conservation, but to raise conservational issues directly pertinent to the tropical rather than the temperate world.

Syllabus = examination syllabus

The second point is addressed more towards the non-Board representatives attending this seminar. It is a simple, but crucial point, namely that the syllabus which any Board publishes for any particular subject, at whatever level, is in fact an examination syllabus. It states what will be covered or included in the examination and it sets down how that subject matter will be examined. It does not really presume to tell the teacher what to teach, or, even less, how to teach. Indeed, it is not normally expected that the teacher will

cover the whole of the published syllabus; rather the curriculum which the teacher formulates and follows will be derived from an essentially selective approach to the syllabus.

So three things need to be emphasised here:

1. Whilst the examination board controls the content, structure and character of the assessment that is made of each student's grasp of a particular subject, its influence over what is taught is distinctly indirect and incomplete.
2. Because a teacher's approach to a published syllabus will normally be selective, it does mean that, whilst it might prove possible to persuade the examination boards to up the conservation content of certain syllabuses, the teacher may well continue to exercise the options either to give that content a pitifully small airing in the curriculum or to ignore it altogether. The fact that most examination papers offer the candidate a choice of questions further increases the scope for taking evasive action.
3. If it is deemed to be expedient to make certain parts of the syllabus compulsory (the examination can be structured in such a way as to achieve this, but would it be fully justified?), it still has to be recognised that the examination board through the medium of its published syllabus is only able to give a general indication of what should be taught. The detail of what is taught is very much the teacher's decision, and how that detail is taught is even more the prerogative of the individual teacher.

Thus, in seeking to promote the teaching of conservation in our schools, we should not adopt the attitude of leaving it solely to the examination boards and their chief examiners to make the running. Any moves they might make have to be closely integrated with parallel moves made, for example, in the training of teachers, both at the initial stage and in-service.

Influencing the Syllabus

Having thus established the caveat that there are real limitations to the impact that the examination board might ultimately have on the curriculum, it is now appropriate to make a few observations about changing the syllabus itself - in this instance, changing it to increase its conservation content. How does one go about it and where does the power lie? How do we influence the course of events?

Getting at the decision-makers

It would be fair to say that the decision to review and revise a syllabus is technically taken by the subject advisory panel of each examination board. Each subject has its guardian advisory panel, and that panel usually has a widely drawn membership, including representatives of various teacher organisations, practising teachers, chief examiners and moderators. It meets once or twice a year, and officially it is the duty of that panel regularly to review the syllabuses that fall within its purview and to set in motion regular revisions (once every 5 years or so) in order to take into account appropriate developments that have occurred within the subject since the previous revision. In the event, it is usually the subject officers, full-time employees of the board, who take the initiative to set such revision work in motion. It seems likely that the subject officers, in their turn, respond to the mail bag and to representations that might be made to them during, say, attendance at conferences, seminars, workshops, etc. Through such communications they will sense, not only that the time has come to instigate a revision of the current syllabus, but they will also have some idea as to the sorts of change that might be countenanced.

So clearly, if the wish is to increase the conservation content of the syllabus (be it in geography, biology, agricultural science, etc.) and if that wish is to be converted into action, then the subject officer should be a prime target for our lobbying. But it is not quite as simple as that, for in practice the subject officer exerts a sort of restraining-cum-screening role. We may put a very convincing case to him, be it in writing or in discussion, but it is the subject officer's job to put our particular pressure into perspective. We must recognise that there is likely to be pressure from other interest groups keen to get other new material into the syllabus. So it would be an unwise subject officer who reacts immediately to the first representation that is made; better await the accumulation of a number of representations before taking any action.

But it is not the subject officers who eventually decide what to cut out and what to include in the new syllabus; it is not they who decide which of the pressures for change should be taken on board and to what extent. The task of syllabus revision is given to a small working party, usually drawn from the membership of the subject advisory panel and comprising the chief examiner, moderator, teachers directly involved in teaching the subject at the level concerned, as well as the subject officer who acts as recorder. That working party then makes its recommendation to the subject panel, which, if accepted, are then passed on to the Secondary Examinations Council for approval. Only when that approval is given will the revised syllabus be adopted. Thus we begin to appreciate that there are a number of people who we need to get at and persuade if we want to convert our wishes into reality - the subject officer, members of the subject panel, members of the appropriate subject committee of the Secondary Examinations Council. Not only do we have to reach quite a lot of people, but we must be sure that we put our case in the

most persuasive manner possible. Furthermore, we need to bear in mind that we are unlikely to be the only ones pressuring for change. This surely places an even greater premium on the need to put the case reasonably and convincingly.

As a short postscript here, the point should be made that it is all very well making the case for including new material in a syllabus; but in order for that material to go in, so something must be taken out. Often there is a great reluctance to do any pruning; the forces of reaction are frequently deeply entrenched and all too easily the syllabus burden is increased, much to the discomfort and displeasure of both teacher and candidate alike.

Deciding what we want taught

So much for the procedural side of trying to increase the teaching of conservation in the schools. Let us now briefly raise a vital matter that hopefully will reverberate through the seminar's discussions. When we say we want to promote the topic of conservation in the classroom, what do we actually mean by conservation, and what do we really want taught? Do we want merely to establish the general objectives of conservation? Or do we want to teach children about the more practical procedures of nature conservation? Or are our aims no greater than to want to make children more environmentally aware and thus more alive to the fragility of environments? Or do we want to place the emphasis on environmental abuse, for example on the more pressing environmental problems that require specific types of remedial conservation action? Or is the real need simply to focus on the relationships that exist between people and their natural environment, particularly in the context of resource use?

One suspects that there is unlikely to be unanimous agreement here as to what we really mean and want. The answer may well vary from subject to subject. For example, the geographer's inclination may be to put the emphasis on environmental awareness and resource use, whilst the biologist might be more inclined to opt for the teaching of straight ecology. Should we be worried if different disciplines have their own views as to what is meant by teaching conservation? Are we likely to make less impact if there is this divergence of view?

Persuading the teacher

Earlier the point was made that it is extremely difficult for the examination boards to determine what exactly is taught. One of the things that tends to deter teachers today from confronting and including new subject matter in the curriculum is the lack of money available for spending on new books and teaching materials. That shortage is bad enough in Britain, but surely it is even more acute in tropical countries. This is perhaps where voluntary organisations represented here today might make a valuable contribution and so influence the course of events in a positive way. The International Centre for Conservation Education (ICCE) and the Council for Environmental Education (CEE) were set up mainly for this purpose; the International Council for Bird Preservation (ICBP) is now active in the field, whilst the World Wildlife Fund (WWF) has been supportive of a number of projects. At home, the Royal Society for the Protection of Birds (RSPB) already provides advice and materials on a considerable scale to British schools in an effective drive to make school children more aware of birds and conservation. No doubt, there are other organisations also playing a part. But can they all do more, especially overseas? It seems clear that the more that can be offered to teachers by way

of resources, the more we are likely to increase the teaching of conservation. In this respect, one concurs with what is stated in the *World Conservation Strategy*.[2]

> Inexpensive teaching materials (textbooks, audio-visual aids, posters, pamphlets, and so on) should be prepared. The materials should explain ecological concepts and the objectives of conservation, using local examples wherever possible.

Cautionary Notes

I would like to seize the chance to mention a couple of anxieties which regularly cross my mind in this context of endeavouring to promote the teaching of conservation. First, there is the worry of whether or not we are being sufficiently realistic and pragmatic? There is a danger of being over-enthusiastic and therefore over-ambitious as regards what we might ultimately seek to achieve. Frankly, it seems wholly unrealistic for the *World Conservation Strategy* to set as one of its objectives the teaching of conservation in the short- to medium-term, but might it not also be more effective to have conservation rearing its head in a number of different subject contexts rather than bundled up as a separate package, which might run the risk of being totally ignored in the curriculum? Equally, is it not unrealistic to expect even the average 16 to 18 year old to comprehend all aspects of conservation, especially the economics? In my opinion, to pursue the cause of conservation to too great an extent does carry the serious risk of overkill. One worries that too keen a pursuit might ultimately prove counter-productive, in

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[2] International Union for the Conservation of Nature and Natural Resources *World Conservation Strategy* Gland, Switzerland, IUCN, 1980) section 13, paragraph 11.

the sense that by ramming conservation down the throats of young people we might lose their sympathy - and ultimately turn them off. We should remember that human nature being what it is, there does tend to be an instinctive reaction amongst the young against those things heavily stressed in formal education.

Secondly, and in a similar vein, there is the worry that a poor teaching of conservation might also serve to deter. School encounters with Shakespeare serve as a timely warning here in that for many, the fatal combination of being introduced too early and taught badly has stifled for ever any real understanding and enjoyment of those plays. So there is a clear need to restrain our own enthusiasm for conservation; we need to set our aims, initially at least, at a fairly modest level. We need to proceed carefully and at the same pace along three related paths, namely:

1. the revision of the syllabus to include more elements of conservation,
2. the proper training of teachers to treat the subject matter sympathetically and in an interesting manner, and
3. the making available of effective teaching materials. In short, we need concerted action, but of an essentially softly-softly and sensitive calibre.

Perspectives on Conservation,

in Public Examination Syllabuses (2)

Brian P. Price[1]

Introduction

My task is to review some examples of London University GCE syllabuses and London and East Anglian GCSE syllabuses and the conservation/environmental elements in them.

Whilst doing this, it is important to remember the following contextual points and their consequences:

1. It is rarely possible for British examinations Boards to develop special syllabuses and schemes of examination for one overseas country or a limited group of countries.

2. Do teachers 'teach conservation and environmental topics', or do they educate children to be 'environmentally aware'?

3. Many examinations syllabuses, schemes of examination and question papers provide the teacher and the candidate with a choice.

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4. Whenever examinations syllabuses are revised and topics are considered for inclusion, it is difficult to agree on compensating deletions.

5. Representation to examinations Boards should be done both selectively and precisely.

6. When planning syllabuses and examinations for use overseas, one needs to think carefully about the local practices and conditions.

University of London A level Geography

This syllabus has recently been revised, for first examination in June 1987. The syllabus working party included a strong representation of members sympathetic to the inclusion of conservation and environmental elements. This shows through in various ways:

1. The syllabus aims to enable the candidates to acquire:

   i. a basic knowledge of the nature and functioning of physical and human environments, particularly an understanding of their inter-relationships and the resulting issues;

   ii. an understanding of the significance of changes in physical and human environments.

2. Syllabus topics with a conservation dimension include:

i. Biogeography - structure, function and distribution of a variety of ecosystems ... special emphasis on adaptation by human activity;

ii. Geomorphology - human activity as a 'trigger' for geomorphic change;

iii. Meteorology/climate - urban climates, visibility, pollution and heat island effects;

iv. Economic activity - the environmental impact of industry;

v. Area studies - human/physical inter-relationships. Environmental and social change.

Whilst no whole question within the published specimen papers is exclusively concerned with conservation and environmental issues, some of the essay questions give scope for bringing these issues in, for example:

2/8 Why is it that an ecosystem, once established, tends to maintain its own internal equilibrium?

2/14 Examine the factors which may cause an industrialist to select a sub-optimal site for a new factory

3/7 Why is it that soils in tropical areas can very quickly lose fertility? What might be done to limit such loss?

University of London O level Geography (Syllabus A)

This conceptually-based syllabus which was first examined in June 1977, and has received minor amendments since then, will soon be reviewed for further amendment, with the overseas candidates only in mind.[2]

Fieldwork is most positively encouraged, local, interaction and conservation studies included. One syllabus section in particular warrants complete quotation:

> The inter-relationships between man and his environment: the problems of resource management and conservation; river control and land drainage; irrigation; multi-purpose river development; land reclamation; exhaustion of natural resources; soil erosion and conservation; air and water pollution; National Parks; urban problems.

From recent examinations, the following questions illustrate the examiners' interpretation of conservation/environmental issues:

June 1986 Select two of the following - a quarry or an open-cast mine; an urban motorway; a coal-burning power station; a National Park; a reservoir. For each, and with

[2] Indeed, the time is now upon us when such revision will be made to many London GCE O level syllabuses, and any representations to the Boards should be made quickly.

reference to named examples:

(a) Discuss the physical and economic factors which have encouraged its development;

(b) Outline the environmental problems associated with its development.

London and East Anglian Group (GCSE) Geology

This syllabus will be examined for the first time in June 1988. Its aims include the creation of an awareness of the importance of Geology in the ... conservation of natural resources ..., and the formation of a basis of a worthwhile leisure activity, with an interest in and a care for the environment. The latter aim is a significant development, of which far more is likely to be seen, suitably phrased for the international candidature, I trust, in the near future.

London and East Anglian Group (GCSE) Environmental Studies

Not unexpectedly, such a syllabus focuses overtly on matters here under consideration. The syllabus aims include such matters as the development of an appreciation of the interaction between people and the environment as well as human responsibilities within the environment; the content is divided into four parts of which three are 'the living environment', 'human activities' and 'managing the environment'. Further, and rather demandingly, the assessment objectives include testing of the candidates' ability to demonstrate an awareness of the significance of attitudes and values in environmental issues.

As with the latter aim in the Geology syllabus, this may be an interesting pointer to the future.

Conclusions

The above are but selected examples of London based syllabuses which contain conservation and environmental dimensions. One could go on to look at others, such as Biology, Economics and Commerce. From these examples, it can be seen that conservation and environmental matters have been encompassed, to varying degrees. Yet, it must be remembered that so have other dimensions of the various subjects. Syllabus developers have been, and should continue to be, responsive to educational change and new perspectives. Yet, they have usually found it necessary, for good reasons, to provide a choice which enables teachers and candidates to take side-steps; lights may have been switched on, but there is no guarantee that every moth will be attracted to them!

Conservation Education in Papua New Guinea

Glyn Gorick[1]

The basis for my contribution to the seminar rests in teaching experience gained in Papua New Guinea six years ago. This involved secondary school agriculture and biology at National High School level.

The education system in Papua New Guinea has been specifically devised for the country's needs and traditions. The courses are written by a team of curriculum development officers together with teachers from the university, teacher training colleges and secondary schools. After undergoing trials in schools, the courses are then refined and published. One of these publications is a teacher's guide to one topic in the Fourth year first term Social Science course at Secondary School. This guide was published in 1975 and is entitled *Man, His Environment and the Future*. The topic has six sections: the world population problem, environmental pollution, the world food problem, the Papua New Guinea environment, nature conservation and economic development.

The guide outlines two important case studies: copper mining and timber production. The giant Bouganville copper mine in Papua New Guinea produces by far the largest export earnings for the country. The mine tailings debris causes serious problems with river sediment and with heavy metal pollution of the coast. A mining agreement was renegotiated in 1974 to include

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[1] 113 Hemingford Road, Cambridge CB1 2DL, (a secondary school teacher with overseas experience).

environmental safeguards. The teacher's guide offers a wealth of data and consequences both for and against the mining operation.

The second study looks at a large project in the Madang area which aims to totally fell the tropical rain forest and supply wood chips to the Japanese wood pulp industry. This is a new technology, using tropical hardwoods for the first time as a source of cellulose pulp. The project aims to replant, possibly with *Eucalyptus degulpta.* However, the problems which may result from this are, a rising water table, an increase in mosquito breeding pools, fertilizer run-off into the rivers and soil erosion. The guide continues with the story of the Amazon Basin rain forests written as a student handout entitled *Burnt in the Name of Progress.* Clearly this is a case study for the country to take note of. Finally there is a board game for twelve players called 'The Environment Game' which is designed to 'develop the student's ability to think critically about development issues'.

Although I have not taught this Social Science course, I thought this small example would be of interest. Ten years after its publication, there are now likely to be many more guides containing exciting material relevant to conservation from both the Social Science and the Science curriculum development groups.[2]

Examples of other publications are from two of the Papua New Guinea Government Departments, the Department of Primary Industry and the Office of the Environment. These two departments are concerned with the development and management of the country's natural resources in line with

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[2] Further information could be obtained from: The Senior Curriculum Officer, Department of Education, Konedobu, Papua New Guinea.

the national development strategy. Although not primarily designed for the classroom these publications are of great use and directly link into the courses taught.

My third point concerns our first attempts at teaching the new ecology section of the biology course. The published course, on trial at the time, gave clear definitions of ecology terms and ideas. It seemed important to include practicals and actually go out and 'measure the habitat'. We progressed as far as using correct techniques, obtaining some measurements and making a start on identification of species. In fact one specimen collected was of great interest; it was noticed by a researcher working on insect behaviour and identified as a new species. This interesting discovery was much discussed at the school, and in some way it illustrates the point that even a school department is able to make relevant observations, make contact with professional scientists and turn classroom theory into more of a real event.

The steady development of a biology department, perhaps linked with the geography, history and art departments, in a rural school, could produce a valuable centre for the display of information about local wildlife, agriculture and industry. From such a base of understanding of the local environment, the school could then investigate how the locality was changing, and be able to bring in elements of first-hand teaching of conservation. This is my view of an ideal way in which that section of a school could operate.

Resource Materials for Teaching Conservation Overseas

Mark Boulton[1]

The Measure of the Problem

Turn the clock back nearly 20 years to 1967 and Kenyatta College in Nairobi, Kenya. Of a class of 40 first year biologists destined to become Kenya's secondary school teachers only two had ever seen the sea (both Asians from Mombasa) and only one had ever seen a lion. Almost all of them had seen the British 'common' frog – it was part of the syllabus in their Overseas School Certificate. I spent a great deal of my time introducing them to national parks and field studies at the coast.

Work on the 'nationalising' of syllabuses began in the early 1970s, but whilst there was a healthy emphasis on Kenyan species and habitats, there was little consideration given to 'ecology' as such, and scant reference to problems of population pressure, loss of forests, desertification etc.

Zambia, where I spent two years in the early 70s appears to have been little different from Kenya since many of the secondary schools worked on the United Kingdom based syllabuses with virtually no conservation content.

Visits to Nepal, Jordan, Saudi Arabia, and Oman as well as extended contact with conservation educators from many African countries represented

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on International Centre for Conservation Education Training Courses over the past four years suggests that the lack of relevant local based conservation material in science and geography syllabuses in particular is **almost universal.**

There are indications that there has not been a great deal of improvement in the conservation content of most of the overseas syllabuses in the last two decades. Changing the content of the syllabus is a time-consuming business and most individuals and organizations interested in improving conservation education have done so by alternative routes.

It is to these alternative routes which have an important role in raising the level of awareness on conservation at both the national and international levels that I now turn.

The Establishment of Wildlife Clubs

The Wildlife Clubs of Kenya

In 1968 a small group of students, supported by an enthusiastic teacher held a workshop on conservation which was to lead to the establishment of one of the most dynamic conservation movements on the African continent: the Wildlife Clubs of Kenya. Their wide range of extra-curricular activities included visits to parks, developing school museums, annual conferences, tree planting days, and wildlife awareness weeks. There are now well over 1 000 clubs plus an associate membership and a national headquarters.

[2] Illustrations supplied by ICCE.

The Chongololo Clubs of Zambia

Started in the early 1970s the development of these clubs has been remarkably similar to Kenya. The 'Chongololo Clubs' were primary school based with an emphasis on looking at the immediate surroundings. There was a regular magazine and teachers notes. The Clubs were so successful that they gradually came to be recognised by the Ministry of Education.

The idea of clubs has caught on; there are now Wildlife Clubs in Uganda, Southern Sudan, Malawi, Tanzania and outside Africa in Indonesia, Malaysia and the nature clubs of India.

They all play their part in conservation education despite obstacles, particularly the need to have a source of sustainable financial support.

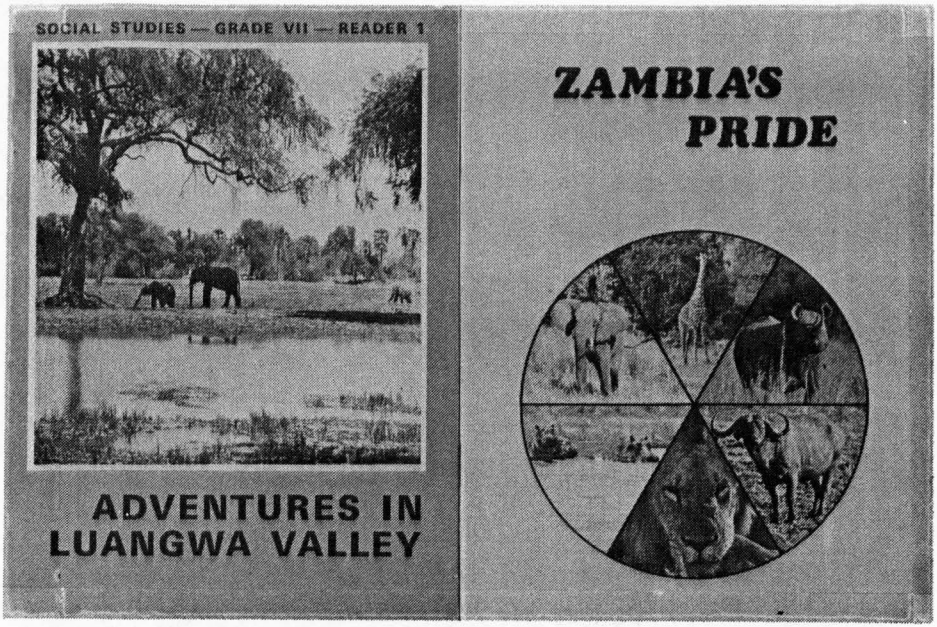
The Wildlife School Concept

An initiative in Zambia, in 1972, resulted in the re-establishment of two Wildlife Schools in Luangwa and Kafue national parks. These conducted one week courses for teachers and students on wildlife conservation.

The Preparation of Conservation Based Books

In Zambia English readers have been written with the Social Studies Section of the Curriculum Development Centre for primary school use. 200 000 copies of *Adventures in Luangwa Valley* were produced with the entire print costs borne by the Ministry of Education who were pleased to have a book provided for them. The book was so successful that it was

reprinted and followed by a second story, *Zambia's Pride.*



School readers have been produced in the Gambia (*Momadou and Kikiango*: a story which tells how owls help control excessive numbers of rats) and in Oman, the production of the first conservation reader in Arabic (20 000 copies) with a further 1 000 printed in English.

Children's bird books have been produced in the Mediterranean countries of Portugal, Lebanon, Turkey, Cyprus and Greece.

In Kenya a comic magazine – the *Pied crow* – has been produced in cooperation with a local newspaper. It was first issued on World Environment


Pied Crab
Rainbow Environment Special
's environment special magazine
POPULATION GROWTH AND WATER
MANGROVES
A CURIOUS WETLAND
WHERE ARE
ALSO INSIDE
LET'S START A TREE NURSERY
WE GROWING?

Day but it has been adopted by CARE and is now produced regularly.

The Use of Radio

Three radio programmes are produced for schools in Zambia, on conservation issues, by International Centre for Conservation Education in cooperation with the educational broadcasting services.

Preparation of Audio-Visuals

International Centre for Conservation Education has produced audio-visual aids in several countries in cooperation with nationals, examples are:

The Gambia and Its Future

Working for Conservation (Zambia)

The Mountain Gorilla (Rwanda)

Mobile Education Units

Field Education Units are being used for regional training courses in Zambia. In Madagascar and Rwanda they are used for education programmes in schools and local communities.

Conclusion

All these approaches are tried and tested and have played a valuable role in the provision of useful conservation education but there is no doubt that the only really satisfactory method of providing conservation (environmental)

education to the majority of children on a regular basis is by the inclusion of relevant material in the established syllabuses.

We should not, however, underestimate the problems.

1. It will take time
2. It will take expertise
3. Training will be required for new teachers as well as in-service training for existing teachers
4. Resources will be required in the form of text books and visual aids
5. It will be expensive

The real question is can we afford NOT to? Look again at the situation in Kenya:

1. already problems of unemployment
2. already affected by desertification
3. already a shortage of land and fuel
4. still a tremendous growth in population

Conservation education **must** become an integral part of education at all levels and we need to explore both the possibilities and the problems with those responsible for curriculum development in developing countries.

Training Teachers for Conservation Education

Roland Randall[1]

When S.T. Broad discussed the educational aspects of nature and conservation in 1969 he said:

> in education lies our only hope of solving this vast problem of ensuring that the natural (biological) resources of the earth are used with wisdom and restraint so that it will continue to provide a suitable habitat for man.

Conservation as a subject can have a co-ordinating role because it is an applied form of ecology. It cuts right across the familiar divisions of botany, zoology and geography since the ecosystem is composed of plants, animals and their abiotic environment. Conservation as a science can therefore only be taught when there is also some knowledge of the underlying ecological principles and equally knowledge of plants, animals and the physical environment of areas under study.

Clearly conservation education can only succeed if teachers are capable of teaching it. Many teachers with biological or geographical degrees have limited ecological knowledge, cannot relate to the detail of the local physical geography and are unable to identify even common plants and animals or birds. Conservation is an holistic affair and should be taught as such, whereas many teachers who become involved see it only in relation to their own

[1] Dr R.E. Randall, Girton College, Cambridge.

discipline.

A good starting point is the concept that conservation is the wise use of a country's resources of land, water and wildlife for every purpose including amenity and recreation. It is concerned with the maintenance of natural systems both for the benefit of the natural components of those systems and for humankind. It is within the area of interaction between people and their natural environment that teachers can best be enthused with conservation principles and taught the importance of management for perpetuity of the resource.

The scope of conservation is very wide and the categories of resource which will be managed for conservation will vary in importance according to the country in question. However they will include agriculture, fisheries, forestry, recreation, water and wildlife. The need for conservation in each or any of these categories can be explained in relation to increases in population, resource use, changing living standards, pollution and non-integrated technology (e.g. DDT). At all educative levels, from the primary upwards, sustained utilization of the resource to be conserved is the essential ingredient to be stressed.

Most countries have, by now, a certain number of legislative programmes to foster conservation - most prohibiting the taking or exporting of the rarer or larger animals. But legislation can only be successful if it follows rather than precedes an educated body of opinion. This must come initially from teachers.

In order to train teachers for conservation education, one of the vital prerequisites is to increase the desire for and abilities in field teaching of

biological and geographical sciences since conservation is above all a field-based science. This complicates the curriculum timetable and may seem expensive in teaching time but in practise it is far more successful than the classroom or the laboratory in getting over the point to the student. Related to the factor of field teaching are the localities in which it is to be carried out, the sort of projects that can be usefully studied and the integration of education and conservation on these sites as a microcosm of the country as a whole.

Even among less-developed rural communities there is a great need to bring young people into contact with the natural environment because there is so great a variety and wealth of inter-relationship which provides untold points for questioning. If teachers care for and respect the environment within which they are teaching, then the children will begin to pick up not only the ecological information but also the ideas of responsibility for what might happen if an area is misused. As the child (and teacher) learn more about the local area in which they live it is possible to develop respect and feeling for living things which is rarely present initially. From this, man himself can be seen as a living organism that needs to fit into nature in order to be successful in the long-term as well as the short.

When training teachers for education within the conservation framework, they must be shown the way in which the structure and function of the whole ecosystem can be demonstrated and so establish the concepts of nutrient flow and energy cycling. In this respect trophic structures are often the best tools. Immediately the problem of identification of local plants and animals becomes necessary. Students will often discover trophic relationships by themselves in the field so a certain amount of freedom of action rather than formal teaching

is a good idea when training a teacher to run a class out of doors.

Where should a teacher carry out field teaching? Nature reserves are often the ideal but in many countries such facilities are not locally available and the teacher must make use of the local area. Many basic principles can be illustrated around the school and it is well worth persuading a teacher to develop a walk (or nature trail) on and around the school property and its adjacent village or urban area. Structure, function and the holistic nature of interaction can be introduced in any habitat.

Beyond the school the teacher should look for areas that contain enough diversity to demonstrate a wide range of habitats, communities and species - a topographic gradient or a geological boundary is often useful. Wetlands are not advised because of potential damage by heavy use and sites of rarities are best avoided. Ease of access through the terrain is also important.

It is obviously a help for the teacher to know the commoner plants, birds, animals, soils, geological outcrops etc. that are likely to be seen. Therefore, the development of basic regional teacher packs is a great help. But long lists of species do not help the teacher or student so much as a summary of the structure and functioning of the main habitats. The fine details can then be developed in the field by teacher and student together.

Another key area of field conservation teaching is concerned with dynamism and the multiple use of the landscape. This can often be clarified in the students mind (and the teachers!) by multiple visits to the same sites at different seasons or even longer intervals. On the ground it is essential that the teacher develops something to follow in the form of a trail along a demarcated

path. At critical points formal instruction can be given while in the areas between the students can be taught to work more freely.

The projects that can be included in conservation field teaching obviously involve data collection on various forms of species/species and species/environment relationships but they will often have the added advantages of introducing elementary forms of analysis and probability statistics. On school property ecological principles can be applied in such projects as creating and maintaining paths, clearance of scrub or unwanted species, and other forms of management.

On an inter-school basis phenological projects can be developed, such as studies of dates of first flowering etc. which can determine features of the growing season and have predictive values in education. Similarly studies on river life and river chemistry by schools along the banks can be related to land-use and land-use change which again can enhance prediction.

At a senior level, teachers should be prepared to take students further afield on camps of a week or more in length to sites where there are more formal facilities - national forests, national parks or other reserves. Here teaching can be integrated with published field guides, use of the ranger/warden, field museums etc. In such locations students can be taught to embark on more advanced projects examining the ecological and conservation perspectives on agricultural change, lumbering, creating of game reserves and similar activities.

Teachers should appreciate and should get over to their students that conservation does not just involve running reserves or happen only in isolated areas set aside for the purpose. In practice it ranges from the national planning

of land-use over large areas to action by individuals. In fact without individual action conservation does not happen. In the less developed world, large-scale developments may directly or indirectly modify, damage or destroy natural environments without public enquiry. Thus conservation education must show the need to argue a case on facts derived from research. The basis of this will be the field teaching that goes on in the school or perhaps the adult education class.

Most teachers at all levels of education have the basic scientific knowledge to develop conservation education within their teaching. What is needed in their in-service training or basic teacher-training is greater understanding in the use of extra-classroom activities and many more basic, local-scale teacher packs to help them in the field.

Case Study - Belize

1. Many villages/schools are situated along rivers e.g. Belize River - orthogonal transects covering riverine woodland to savanna could be recorded showing special effects of a village site.

2. Belize River shows great variation in silt load along its course and through out the year. Local schools could relate this to land use and land use-change.

3. Sugar cane is declining and new crops - soya, rice, peanuts etc. are coming in, along with greater fertiliser use. Schools could assess the effect of this on soil/wildlife etc.

4. Pine Ridge forest is central to the country and could be used for senior level studies on the effects of lumbering and fire.

5. Rapid growth of tourism and pollution are affecting the offshore barrier reef. Studies could be made to assess the sustainable value of this resource as a tourist, fishing and wildlife unit.

6. Increased commercialisation of banana production in the south is causing severe soil erosion. This would make an ideal local study of short versus long-term benefits.

7. Mennonite agriculture in the Central Belize River valley has shown the effect of large inputs of capital and machinery contrasting with the impoverished Salvadorean milperos. This makes a superb study of the effects of different levels of technology on the landscape.

Each of these could be the unit of field-based conservation education, with field-trails, and education packs. Each could very usefully form the basis of questions suited to O or A level examinations.

Conservation and Education

A Discussion Paper on the Seminar

Simon Albrecht and Michael Rands[1]

What is Conservation?

At the start of the discussion we should perhaps begin by defining conservation and describe what is meant by the teaching of conservation in the context of this paper. Our discussion concerns the conservation of the world's natural resources; the earth, the waters and the air, and the life that they support. This excludes the conservation of man made artefacts such as buildings, paintings or machines, important as these are in other contexts. We are particularly concerned with the way the natural world functions, the processes that are involved, what is necessary for their maintenance, and how the processes are interrelated. The essence of nature conservation is perhaps best summarized by the three main objectives of the *World Conservation Strategy* namely: the maintenance of the life support systems of the planet; the preservation and conservation of genetic diversity and wild species; and the sustainable exploitation of the world's plants and animals.

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[1] Mr J.S.M. Albrecht, 12 Hemingford Road, Cambridge CB1 3BZ and Dr M.R.W. Rands, International Council for Bird Preservation, 219c Huntingdon Road, Cambridge, CB3 ODL.

Why is Conservation Important?

Until the publication of the Brandt Report[2] and the *World Conservation Strategy* [3] the state of the natural environment, conservation and the environmental relationship between the developed and developing worlds were considered, in the main, to be spare-time, after-work hobbies rather than major issues in human affairs. However, in recent years these topics have become increasingly important in our lives and have come to dominate many items of news – the famine in Ethiopia, the agricultural food mountains in Europe and the nuclear energy debate are three recent examples. The famine in Ethiopia is an illustration of one of the major problems facing humankind today, namely how to get successful development in the rural areas of developing countries (where about half the world's population live). Many of these rural people are extremely poor and are forced to strip the land of vegetation. This leads to the breakdown of the soil, loss of fertility and the disruption of peoples' life support system. This can only be overcome by massive, conservation-based economic development, which must include pasture improvement, fuelwood plantations and alternative food and fuel until the environment has recovered. This development must take place with the cooperation and consultation of local people. Similarly, conservation needs to be considered in the early planning stage of industrial development. If the energy or raw material source of any industry is destroyed through bad conservation practice, the development will be a financial failure. In addition, the needs of food production, water purity and environmental health should be assessed in a

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2 *North-South: A Programme for Survival. The Report of the Independent Commission on International Development Issues* (London, Pan Books, 1980)

3 International Union for the Conservation of Nature and Natural Resources *World Conservation Strategy* (IUCN, Gland, Switzerland, 1980).

proposed development area. Thus, conservation is essential to the success of economic development, the raising of living standards and to general improvements in peoples' lives.

Nevertheless, while it is important to emphasise that a sound knowledge of conservation has real practical advantages in a large number of fields, one must not lose sight of the fact that conservation is also vital to the somewhat nebulous term 'quality of life'. 'Quality of life' has its more practical and economic expression in the word 'leisure', but it is more than this. It is concerned with freedoms, our philosophies of life and our morals. This point has been well argued and summarised by Collar.[4] It follows that conservation is not just relevant to scientists and economists but is of concern to everybody.

Conservation may have made a recent appearance in the headlines of news programmes but its practice is extremely old. Traditional farming methods of rural communities throughout the world contain many elements of good conservation practice. The conservation ethic is often strong in these communities and many of the rural poor know how to conserve their environment but are caught up in the crisis of human ecology and world economics. Conservation is most easily advocated by those who are neither poor nor hungry so it follows that conservation is as dependent on economic development as much as economic development is dependent on conservation. One cannot succeed without the other.

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[4] N.J. Collar 'Species are a Measure of Man's Freedom: Reflections After Writing a Red Data Book on African Birds' *Oryx* 1:15-19, (1986).

What is the Role of Education in Promoting Conservation?

Conservation is most successful when people know what, how and why to conserve, and when they perceive that it is relevant to them and their aspirations. The role of education in promoting conservation is to supply information and develop an understanding among people of all ages and occupations. A major theme of the *World Conservation Strategy* is that human societies need a new ethic to enable them to live in harmony with the natural world on which they depend for their mutual wellbeing and survival. Education has long been concerned with, and has done much to shape the ethics of society. Indeed our ethics or attitudes to life are one of the things that remain when we have forgotten everything else that was learnt at school. Education therefore plays a key role in creating a sympathetic attitude to the natural world so that the correct decisions can be made on matters affecting the environment. Many conservation organisations have already done much to change public opinion so that the environment and its wellbeing is thought to be far more important than was the case thirty years ago.

While education is important for explaining the facts and principles of conservation and for influencing public opinion, it is essential that this is done in the context of the local community and situation. This means that the illustrations and examples used must, in general, be from the area or country concerned and not from the other side of the world.

Why should Conservation be Included on Examination Syllabuses?

The audio visual presentation *Planning for Survival* which introduced the seminar makes it clear that inclusion of conservation in examination syllabuses no longer has to be justified. Indeed, it is its exclusion that must now be justified. Conservation needs to be included in certain syllabuses simply to keep the subject up to date. Today's examination candidates are going to make important decisions concerning the environment in the future so it is important that they should at least understand the basic principles involved. Furthermore, its inclusion on examination syllabuses is a very efficient way of promoting a knowledge of conservation even among non-examination students since their curricula are heavily influenced by examination requirements. Putting conservation into examinations should not therefore be regarded as elitist but simply as a contribution to ensuring that *all* students get a reasonable education in the subject. Exactly how conservation is taught will depend on the abilities of the particular students involved.

It is clear that putting conservation into examination syllabuses will not of itself change very much very quickly. The problems of the environment and their causes are far more complicated. Nevertheless, just as society influences what is taught in schools so what is learnt in schools influences society. Future generations should be able not only to discuss the environment with a greater knowledge of it and its conservation but also to do so in an atmosphere that is less polarised than many that exist at present.

While the inclusion of conservation on a syllabus does not guarantee that it will be taught, since teachers are able to select their subject matter from within a syllabus and do not cover all the options, it is equally true that leaving it out

will more or less guarantee its total neglect. The pressures of school timetable and examination syllabus are such that in the main only what is required is taught.

Conservation is important because it touches many aspects of peoples' lives. It is concerned not only with their survival and physical wellbeing but also with their economic and cultural development. It follows, therefore, that conservation is relevant to most subjects taught in schools and should therefore be included in most examinations. Nevertheless, there are perhaps three subject areas which particularly merit the inclusion of conservation. The first is environmental and biological sciences, including related subjects like geography and agriculture, because these deal with the natural environment itself. The second is the physical and chemical sciences and related subjects like engineering, because these can have direct and serious effects on the environment. The third is economics and related subjects, because economic development also affects the environment and its success often depends on a sound conservation policy. All the above subject areas need careful consideration in spite of apparent difficulties, because conservation is a valid part of the subjects and also conservationists need, and successful conservation depends on, an integrated holistic approach to the subject.

Some Considerations and Problems.

One of the main themes running through these proceedings is that conservation must be relevant to the local situation and needs. This is particularly true of conservation education, including examinations. It is therefore no longer sufficient to give everyone the same exam irrespective of where in the world they live. The test must be of the students' knowledge of their home country

rather than of a land on the other side of the world. This requires either individual syllabuses for each country or else a sufficient number of options to accommodate all the students.

Within each society there are some traditions and practices which favour conservation and others which do not. Traditional farming, for example, is often good conservation practice. Agriculture is a key to development; if a country can feed itself its economy is much stronger. Agriculture needs to combine the best of tradition with suitable modern methods. However, many people in developing countries see agricultural employment as enslavement to the land and education as a way of escaping to the cities and freedom. While the causes of this belief lie outside education in the main, educators must incorporate in their teaching and discuss with the students the causes and implications of the various traditions and practices.

One of the problems is to decide what precisely should be taught under the heading conservation and how it should be taught. This is not something that we intend to answer here since it is likely to vary significantly from subject to subject and require further research. However, the three main aims of the *World Conservation Strategy* – the maintenance of life support systems, genetic diversity, and the sustainable use of biological resources – should feature strongly and be a guide to what is taught. It should also be remembered that conservation is practical and students should have practical experience as well as theoretical knowledge.

Another problem is that of suitable resources and the lack of textbooks with local examples. Nevertheless, the appearance of conservation as a topic on examination syllabuses would do much to stimulate the publication of

suitable texts. The most important factor in any teaching process is the teacher who can literally make or break a subject for the students. It is therefore essential that suitable training be given regularly to teachers. One way of providing such training would be to organise a series of seminars where teachers from overseas studying in Britain could be brought together with British teachers and conservationists. This suggestion, put forward during the discussion at the seminar, would help promote the international importance of conservation, giving encouragement, ideas and relevant training to those involved in conservation teaching. We suggest that conservation and education organisations take the initiative in this and consider hosting such seminars. The sponsors, editors and authors of these proceedings are all prepared to provide advice and support in this context.

To conclude, it is clear from the seminar that conservation needs a clearer, wider and more thorough hearing in examination syllabuses. This must be accompanied by appropriate teacher training and the provision of appropriate and locally relevant conservation education materials. The International Council for Bird Preservation, in collaboration with its co-sponsors, intends to pursue this further and produce detailed recommendations for a range of examinations. The authors invite support and collaboration in this important pursuit.

Appendix 1

The Teaching of Conservation with Special Reference to
Tropical Countries

A Discussion Paper for the Seminar

> Several countries in the tropics (e.g. Zimbabwe, Brunei and Belize) operate school examination systems based on curricula set by UK Examination Boards. Many other Commonwealth Countries also use these syllabuses as models in their own schools. Therefore, there is great potential for teaching the principles of conservation to students doing British 'O' and 'A' level exams from tropical countries, by enhancing the conservation component of the examination syllabuses themselves. The importance of conservation in the daily lives of people around the world is growing rapidly, yet many students often leave school having never even been introduced to basics such as the importance of forests for water catchment and soil conservation, the various types of pesticides and their environmental impacts, or the need to keep the human population size at a sustainable level.

Many of the financially and educationally better off children in tropical countries are examined in English at 'O' and 'A' level in all their subjects by the overseas departments of several of the United Kingdom Examination Boards. It follows that many of these children are likely to hold key posts within their countries in the future. Some will be involved in critical decisions affecting the environment and conservation. Investment in conservation education at this level is therefore likely to bring rewards.

At secondary school level what the (generally) brighter examination students are taught is determined principally by what is required by the examination syllabus and secondarily by the interests of the teacher. Therefore, to ensure that conservation is taught, it must be on the 'O' and 'A' level examination syllabuses.

A preliminary list of the subjects which should have a conservation content is given below.

Environmental Science	Human & Social Biology	Economics
Biology	Geography	Commerce
Zoology	Agriculture	Commercial &
Botany	Agricultural Science	Business Studies

The list is based on two main considerations; the first is those subjects which traditionally teach ecology, land-use and vegetation cover: these subjects are principally biology and geography. The second is those human activities and industries which have the greatest impact on the environment in general and natural habitats in particular. These include agriculture and forestry and so-called 'industrial and economic development', i.e. factories, towns, roads, mines, dams, etc. From this second consideration it follows that the relevant academic/examination subjects include agricultural sciences and also economic, commercial and business studies because those who decide on developments are often bankers and industrialists.

The Council for Environmental Education has carried out a valuable exercise to evaluate the environmental content of the five hundred or so United Kingdom national syllabuses in use in 1986 by 19 Examination Boards. Every main curriculum subject, with the exception of Modern Languages, English Language and Literature, and Music, had at least one syllabus with some reference to environmental issues (mostly pollution or energy conservation). However, the environmental content varies widely between syllabuses and Boards.

An examination of the overseas syllabuses of the Cambridge, London and Associated Examining Boards reveals that in most subjects the syllabus is the same for both the United Kingdom and overseas students. The main exception is Geography which often has a regional bias.

A preliminary analysis of the Conservational Content of the Geography and Biological Syllabuses of the above three Boards has been carried out and is presented below.

A comparison of the Conservation Content of the Overseas Syllabus of Geography and Biological Subjects set by the Cambridge Local, London and Associated Examining Boards

\- Not set
0 No conservation at all

1 Virtually no conservation
2 Conservation content poor
3 Average - room for improvement
4 Good
5 Very Good

Subject	Level	Cambridge	London	A.E.B.
Geography	0	1	3	4
Geography	A	4	3	5
Biology	0	1	4	3
Biology	A	2	4	4
Human/Social Biology	0	1	1	1
Human/Social Biology	A	-	-	- *
Agriculture	0	0	-	-
Agricultural Science	0	1	-	-
Botany	A	4 **	4	-
Zoology	A	4 **	3	-

Environmental Science is not offered to any overseas student.

* but 3 in home syllabus

** these are only offered to students in the UK and Caribbean

It seems that there is wide variation in the conservation content both between related subjects within an Examining Board as well as between the different boards.

Some consideration has also been given to what is currently available in biology text books. D.G. MacKean's popular O level book *Introduction to Biology* has a chapter on Ecology but has little on conservation or forest protection except in the context of soil erosion. It is considered that any text book used in teaching conservation should have, among other things, a chapter dealing with the economic importance of natural and semi-natural habitats, including wetlands and primary and secondary tropical forest using information like that given in *The Primary Source, Tropical Forests and our Future* by Norman Myers. To make up for the relative paucity of environmental materials for school use, organisations such as the Council for Environmental Education, World Wildlife Fund (UK) and the Royal Society for the Protection of Birds have been active in providing teachers with packs that can be used to give instruction within the existing domestic syllabuses.

With respect to the teaching of conservation abroad, similar activities have been carried out for some years by many UK-based international organisations, including World Wildlife Fund, the International Centre for Conservation Education and the International Council for Bird Preservation. However, so far no systematic examination of the syllabuses used in schools overseas, but set from England, has been undertaken. In view of this, it seems appropriate to initiate a similar project as that described above for the domestic syllabuses by holding a seminar involving the various interests involved. This seminar (see programme sheet) has therefore been organised to address the following points:

- To determine what is the present conservation content of relevant subjects taught at O and A level in Overseas Syllabuses.

- To discuss with Examining Boards and other relevant bodies whether conservation needs better coverage in the overseas syllabuses and if so how this can be done, including methods for giving the subject adequate attention in classroom teaching.

- To review the already available teaching materials and if necessary to devise an appropriate Teachers Conservation Pack for use overseas.

At the close of the seminar, a small working group of volunteers will be formed to follow-up its conclusions. The sponsoring organisations will endeavour to provide such administrative and research assistance to the working group as may be necessary.

Appendix 2

SEMINAR ON TEACHING CONSERVATION OVERSEAS

Tuesday, 23rd September 1986, at Homerton College

Schedule

09.30	Arrival at Homerton College
10.00	Chairman's Welcome John Baines (Director, Council for Environmental Education)
10.10	Planning for Survival Audio-visual presentation from International Centre for Conservation Education
10.30	Coffee Break
11.00	Some aspects of training teachers for conservation education Dr. Roland Randall (Girton College, Cambridge)
11.30	Perspectives on conservation in the London Board's Geography Syllabus Dr Mike Witherick (Southampton University/Welsh Examination Board) Brian Price (Schools liaison officer, London Board)
12.30	Conservation and Education in Kenya: the local view John Achoka (Kenya teacher)
13.00	Lunch Break: self-service buffet available
14.00	Conservation education in the East African secondary school Stephen Tomkins (Head of Biology, Hills Road Sixth Form College, Cambridge)
14.30	Conservation education in Papua New Guinea Glyn Gorick (secondary teacher with overseas experience)
15.00	Conservation education and the UK syllabus Peter Martin (WWF-UK Education Department)
15.30	Tea Break
16.00	Resource materials for teaching conservation overseas Mark Boulton (Director, ICCE)
16.30	Discussion (lead by Simon Albrecht)
17.00	Chairman's close
17.15	Departure

Appendix 3

SEMINAR ON TEACHING CONSERVATION OVERSEAS

Tuesday, 23rd September 1986, at Homerton College

Participants:

John ACHOKA British Council/School of Education, University of Reading
Adam ADAMOU Royal Society for Nature Conservation
Simon ALBRECHT International Council for Bird Preservation
John BAINES Council for Environmental Education
Jeff BATTERSBY National Union of Teachers
Rupert BOOTH Department of Education and Science
Mark BOULTON International Centre for Conservation Education
Adam CADE Nature Conservancy Council
Mrs Erica CLARK London Examination Board
David ELCOME Royal Society for the Protection of Birds
John FRENCH Cambridge College of Arts and Technology
Glyn GORICK Cambridge
Roger HAMMOND Earthlife
Ian HEPBURN Royal Society for the Protection of Birds
Miss P.M. HULL Delegacy of Local Examinations, University of Oxford
Carole INSKIPP Nature Conservancy Council
Mark JEFFERIES Urban Wildlife Group
Dr Sandy HARCOURT Department of Applied Biology, University of Cambridge
Gary KNAMILLER Overseas Education Unit, University of Leeds
Mrs LEE London
Keith LINDSAY Department of Applied Biology, University of Cambridge
Dr Richard LUXMOORE International Union for the Conservation of Nature and Natural

Resources

Heather MACLEOD International Council for Bird Preservation

Neil MARRIOTT Earthlife

Peter MARTIN World Wildlife Fund, (UK)

Paula MUNRO African Studies Centre

Bryan PRICE University of London, School Examination Board

Richard PRICE University of Cambridge Local Examination Syndicate

Dr Roland RANDALL Girton College, Cambridge

Dr M.R.W. RANDS International Council for Bird Preservation

John SCHERLIS Department of Zoology, University of Cambridge

Tony SEDDON Cambridge University Press

Dr Janet SEELEY African Studies Centre

Marjorie SUTCLIFFE Cambridge College of Arts and Technology

Stephen TOMKINS Sixth Form College, Cambridge

Dr Eric TURNER Oxford and Cambridge Schools Examination Board

Thomas URGUHART International Council for Bird Preservation

Wim VERHEUGHT International Council for Bird Preservation

Dr Rex WALFORD Department of Education, University of Cambridge

Dr Andrew WARREN Ecology & Conservation Unit, University College London

Mr WATERS Joint Matriculation Board

Miss WILLIAMS Welsh Joint Examination Board

Dr Doug WILLIAMSON Department of Physiology, University of Cambridge

Dr Mike WITHERICK Southampton University/Welsh Examination Board

Bibliography

This is a select bibliography intended to give a brief introduction to the considerable amount of literature that exists on ecology and conservation. The International Council for Bird Preservation, the World Wildlife Fund, the International Union for the Conservation of Nature and Natural Resources, the Council for Environmental Education, and the International Centre for Conservation Education produce a variety of publications useful in conservation education. Should further details be required, write directly to them for their current catalogues.

Beek, Meryl and John Baines

Environmental Education and Examinations The final report of a research project undertaken by the Council for Environmental Education into the environmental content of examination syllabuses at CSE, 'O', Alternative and 'A' levels (Reading, CCE, 1985) Available from the Council for Environmental Education.

Council for Environmental Education

Environmental Education Resource Sheets Series (Reading, CCE) Individual sheets on topics such as: 'Environmental Education in Theory and Practice'; 'Planning and Environmental Education'; 'Tropical Forests'; 'World Environmental Issues'.

Environmental Education and CEE (Reading, CCE, 1983).

Why Environmental Education? (Reading, CEE) One of the CEE *Introductory Leaflet Series.*

What is Environmental Education All About? (Reading, CCE). One of the CEE

Introductory Leaflet Series.

Deshmukh, I. — *Ecology and Tropical Biology* (Oxford, Blackwell, 1986)

Eltringham, S.K. — *Wildlife Resources and Economic Development* (Chichester, John Wiley and Sons, 1984)

Goudie, A. — *The Human Impact: Man's Role in Environmental Change* (Oxford, Blackwell, 1986 [new edition]).

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Simon, J.L. and H. Kahn (ed.) — *The Resourceful Earth: a Response to Global 2000* (Oxford, Blackwell, 1984)

Warren, A. and F.B. Goldsmith, (eds.) — *Conservation in Perspective* (Chichester, Wiley, 1983)

Useful Addresses

Institutes/Organisations/Aid Agencies

This is a select list of addresses and is not in any way intended as an exhaustive guide to all the organisations involved in conservation education. Apart from the possibility that organisations may have been omitted because they are not known to the compiler, new institutions and research projects may be established as funds become available for conservation research; likewise, institutions close down when funds and/or interest wanes. Nevertheless, it is hoped that readers will be able to use this list to obtain up-to-date information on conservation and education activities and publications.

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CATHOLIC INSTITUTE FOR INTERNATIONAL RELATIONS
22 Coleman Fields
London
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Tel. 01 354 0883

CENTRE FOR WORLD DEVELOPMENT EDUCATION
Regent's College
Inner Circle, Regent's Park
London
NW1 4NS
Tel. 01 487 5438/5474

COMMONWEALTH DEVELOPMENT CORPORATION
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W1A 3AR
Tel. 01 629 8484

CONSERVATION FOUNDATION
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Washington D.C.
20036
USA

CONSERVATION MONITORING CENTRE
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Cheltenham
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Tel. (045 15) 549

INTERNATIONAL COUNCIL FOR BIRD PRESERVATION
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ROYAL SOCIETY FOR THE PROTECTION OF BIRDS
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