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ABSTRACT

The seminar aimed to improve the degree and quality of Environmental Education Research (EER) in the context of global environmental change with particular emphasis on the role of the social sciences. The report is divided into six sections and appendices. Section 1, an introduction, includes the seminar background, aim, objectives, and chair's introduction. Section 2 is comprised of submitted papers, arranged under two headings: (1) A Critical Review of EER; and (2) Measuring the State of Environmental Education (EE). Section 3 includes summaries of seminar presentations concerning policies, opinions, actions, and conclusions of an international survey. This survey indicates the status of EE in the curriculum of educational systems. Working group reports summarized in section 4 include the topics of the nature and context of EER, key areas for EER, and specifications for research. Section 5 includes a discussion of philosophical and practical issues. The Chair's closing observation and broad conclusions comprise section 6. Appendices include a review of general and evaluative research, international research programs, funding sources, references, registers and journals with EER reports, and a list of participants. (MCO)

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**ENVIRONMENTAL EDUCATION
RESEARCH**

SEMINAR REPORT



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**ENVIRONMENTAL EDUCATION
RESEARCH**

SEMINAR REPORT

June 1992



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CEE is the national body for the coordination and promotion of environmental education, acting as a forum for the exchange of ideas and information and encouraging its development. CEE seeks to influence both policy and practice in environmental education through the formation of partnerships with and between its members.

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English Nature is the statutory adviser to Government on nature conservation in England and promotes the conservation of England's wildlife and natural features. Through the Joint Nature Conservation Committee, English Nature works with sister organisations in Scotland, Wales and Northern Ireland on UK and international nature conservation issues.

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SECTION 1

INTRODUCTION

This is the report of the seminar on Environmental Education Research held at the Policy Studies Institute, London, on 3rd December 1991. It was organised by the Council for Environmental Education and English Nature in association with the Economic and Social Research Council.

The seminar reviewed recent developments in Environmental Education Research and helped to identify ways forward. It brought together nearly 40 invited researchers and representatives of funding bodies. This report is intended to help stimulate new levels of interest, debate and activity in Environmental Education Research.

Background

The seminar was held because, in comparison to a number of other industrialised countries, relatively little research has been carried out in environmental education in the UK over the past two decades. This neglect contrasts with the increasing attention being paid to environmental education, particularly as regards its potential contribution to addressing problems of global change.

In March 1991, the Economic and Social Research Council launched the Global Environmental Change Programme. Theme B on International Policy and Agreements includes a reference to environmental education, "Environmental education, as a mechanism for influencing opinion, also merits international comparisons".

Internationally, the United Nations Conference on Environment and Development (UNCED) and the European Community 5th Environmental Action Plan are likely to accelerate interest in environmental education and highlight the need for research.

Aim and objectives

The seminar aimed to improve the degree and quality of Environmental Education Research in the context of global environmental change.

This was achieved by:

- ◆ reviewing the current state of play in Environmental Education Research.
- ◆ exploring the benefits, opportunities and priorities for Environmental Education Research in the context of global environmental change.

Key questions were explored through discussion:

- 1 What research has been carried out or initiated?
- 2 How can research help develop environmental education in terms of:
 - ◆ public opinion formation
 - ◆ evaluation and monitoring
 - ◆ international structures
 - ◆ delivery models and methodologies
 - ◆ the concerns of UNCED?
- 3 What skills, expertise and mechanisms are necessary for wider collaboration in research?
- 4 How can ideas and information about research be more effectively disseminated and exchanged?
- 5 How can research be more effectively planned, assessed and funded?

The seminar and this report are seen as the beginning of this exploration, which it is hoped will lead to significant and continuing

progress in Environmental Education Research.

Chairman's Introduction

Professor Michael Redclift, Research Coordinator, Global Environmental Change Programme, Economic and Social Research Council; Professor in Rural Sociology, Environment Section, Wye College, London University.

One of the key questions that the Global Environmental Change Working Group of ESRC has asked itself concerns the role of social science in averting global environmental change problems. The natural science research contribution is not sufficient in itself and needs to be complemented by other approaches. The main thrust of ESRC's work is towards providing relevant, useful social science research which will facilitate better environmental policy. But enabling better policy raises the question of what makes policy work. It is here that environmental education has an enormous contribution to make.

To meet the challenge of increasingly global environmental problems we need to know three things:

- ◆ how people understand the link between their behaviour, the behaviour of other people, and the environment
- ◆ what credence and response people give to scientific knowledge about the environment
- ◆ what credence and response people give to other types of knowledge about the environment

Underlying these questions, we need to look at the fundamental commitments and patterns in our lives in terms of, for example, the transport system, health system, patterns of consumption and of income generation. These and many more areas have important effects on the environment. How do people understand what's happening? What changes

are they willing to make? What is the basis of any change that people make in their lives?

It's often suggested, particularly within policy circles, that the current public interest in the environment is evidence of the adequacy of information on environmental issues, and represents acknowledgement of the urgency of tackling problems. But it may be that instead, public interest indicates unease about the availability and quality of information that can illustrate the connection between their behaviour and environmental problems. In a sense, the public has been let down by politicians, policy-makers, and perhaps by scientists, because it doesn't know what is expected of it. But if we are to find the pathways to sustainability, we have to start with public understanding.

What is needed is environmental literacy, through which we can ask ourselves what is sustainable. An audit of our lives and of our social institutions is needed at a deep level - which may be very uncomfortable.

There are some very positive signs, since the publication of the Brundtland Report of 1987, that environmental education and the cluster of issues that surround it have really begun to occupy the attention of environmentalists, the public, and policy makers. This is evident in the second version of the World Conservation Strategy, *Caring for the Earth*, and in the preparations for the United Nations Conference on Environment and Development (UNCED).

One approach to environmental education focuses on what would make the public more educated on environmental matters, but perhaps the real challenge is considering what would make professionals and policy-makers more aware of people's attitudes and values. The approach should not be that professionals have a body of knowledge that needs to be passed down for the public use. Instead, environmental education has to be an interactive process. In addition, we need to recognise that our understanding of the environment is socially constructed, and

therefore international comparison with other cultures, including Europe and the Third World, is important.

These are auspicious times. There is much to be done, against a background of great urgency. For its part, the ESRC is attempting to take the environment into the heart of social sciences and policy-making, and at the same time, take the social sciences into environmental concerns. This includes some support for Environmental Education Research projects.

SECTION 2

SUBMITTED PAPERS

A critical review of Environmental Education Research

Stephen Sterling, Consultant in environmental education, Executive Editor of the Annual Review of Environmental Education

Introduction

The status of environmental education has risen over the last four years with increasing official recognition. With this, more rigorous attention has been paid to all aspects of its theory and practice. This new interest is both stimulated and exemplified by the endorsement of the role of environmental education in key UK and international documents as shown in section 4.3.

Environmental education and environmental training are increasingly seen as a critical means of achieving a more sustainable economy and society - a goal that will be at the centre of the UNCED conference of 1992, and will increasingly inform EC environment policy.

This spotlight has thrown into relief deficiencies in the research base underpinning environmental education practice, particularly but not only in the UK. Lack of investment and coherent planning due to the marginal status of the field for nearly two decades pose a problem and challenge which need to be faced if environmental education is to fulfil the high expectations now being pinned on it. Not least, good research might recover the potential of education from the danger of an oversimple equation being made between education, society and sustainability.

Yet progress does not just depend on investment in research, but requires some reorientation of educational thinking and

structures. Being holistic, interdisciplinary, cross-sectoral and life-long means that environmental education falls between institutional stools. It remains the challenge to institutions which may become involved in Environmental Education Research to adapt to the nature of environmental education, rather than the other way round.

We are in a period of rapid social and environmental change. How far environmental education can help interpret and shape this change is a critical question. Not least, we seem to be expecting education to take on a new role - on perhaps a massive scale - that of helping create a future which is fundamentally different from patterns of the past. Such a radical change demands much enhanced recognition and support for Environmental Education Research, and its shift from the periphery of environmental and educational policy.

Defining and categorizing Environmental Education Research

One categorisation of Environmental Education Research might be:

- 1 By subject area or emphasis
- 2 By sector or age level
- 3 By narrow or broad focus
- 4 By the agent or scale of research

Taking each of these categories in turn, and with some exceptions, Environmental Education Research in the UK has tended to:

- 1 concentrate on curriculum development
- 2 concentrate on the formal sector and school age
- 3 mostly be narrowly focused
- 4 be conducted at a small scale by agencies such as NGOs and local

authorities involved in the field rather than research institution.

By expanding this narrow focus, gaps and areas of imbalance are quite easily identified in broad terms. For example:

1 Other subject areas:

- ◆ effectiveness of environmental education such as change in public opinion, perception or action, including the relative roles of different media or channels
- ◆ evaluation and monitoring of status of environmental education such as growth, provision and quality
- ◆ development and evaluation of delivery models and methodologies in environmental education
- ◆ analysis of research including monitoring and dissemination

So the three emphases of information gathering, developmental work, and evaluation all need attention.

2 Other sectors:

- ◆ non-formal education, youth and adult
- ◆ further and higher education
- ◆ continuing education and training
- ◆ industry, unions and professions
- ◆ media
- ◆ local and central government and policy makers

Further, a balance of broadly and narrowly focused research is needed, involving a broad spectrum of agents.

Rationale and benefits

Environmental Education Research should inform, improve and develop environmental education practice and policy.

It should: --

- ◆ help identify and address real needs
- ◆ help deploy resources and investment in environmental education programmes usefully and effectively
- ◆ develop and promote the extent and quality of environmental education provision
- ◆ improve coherence in environmental education policy and practice
- ◆ help link environmental education practice with the need to implement and shape public environmental policy, particularly in the context of rapid global change.
- ◆ help environmental education as a whole to respond to new needs and levels of interest from both practitioners and policy-makers, including pressure from international developments eg European Resolution, UNCED.

Without well-conceived and conducted research in environmental education, many aspects of environmental education are likely to suffer.

Current trends in the UK and abroad

UK

The level of research for environmental education does not yet match the level of interest. Many of the needs for environmental education are based on the perceptions of those active in the field rather than on solid research.

In particular, the progress of environmental education now is constrained by lack of investment in the past. To give one example, the Learning through Landscapes Trust says "one of the problems is that there is still not enough concrete evidence which documents the ways in which learning is more successful in a quality environment" (LTL, 1991).

However, this general deficiency is beginning to be remedied, at least to some degree, by a number of current projects which, given the apparent shortage of time, are very practical in their orientation. However, more funds, time and energy are needed. The argument that a greater proportion of educational research funds is needed to address basic Environmental Education Research needs was put in a response to the White Paper on the Environment. (CEE, SEEC, WCEE, 1991). Despite the Government's recent claim, quoted in the education section of its First Year Report of the White Paper, that it spends some £300-400 million per annum on environmental research, the percentage related to environmental education must be minimal (HM Government, 1991).

There are various sources of funds for research which are reviewed in Appendix 3. Whilst these sources and initiatives are welcome, there is still a dearth of funding sources available to researchers, particularly if the research is in an area not seen by government or government agencies as priority. Government funding in some other countries is much more freely available.

USA and Australia

The United States has had a continuing and larger commitment to Environmental Education Research than the UK, with particular researchers and institutions specialising in this field. Their work has been well documented in journals, and in particular is accessible through the ERIC/SMEAC database which has consistently documented and monitored research. Much of the US research identifies methodologies and factors resulting in behavioural change, that is the

effectiveness and impact of environmental education (Howe & Disinger, 1991).

The recent National Environmental Education Act 1990, led to an Office of Environmental Education being set up in the Environmental Protection Agency, controlling a budget of \$12 million per year which is set to increase. (ERIC/SMEAC, 1990). Clearly, funding for Environmental Education Research in the US will be in a healthy state.

However, the instrumental approach dominant in the States has been criticised, particularly by some researchers in Australia. The thrust of Environmental Education Research in Australia is more centred on practitioner and learners. It uses action research where the researcher and educator, who may be one and the same, cooperate together to clarify values explored through educational practice, goals and evaluation. In particular, Rowbottom (1990) is very critical of the dominant North American approach which he claims is "behaviourist, positivist, instrumental and deterministic, imposing the researchers' environmental, educational and social values onto pupils and teachers in a way that is fundamentally disempowering" (Rowbottom, 1990). Rowbottom's concern is that behaviourist research tends towards social control guided by unexamined goals set by the researchers - in contradiction to the educational objective of environmental education: the development of independent and critical thinking in relation to environmental issues. By contrast, some Australian research is more oriented towards socially critical pedagogy than its American counterpart, and would claim, is more politically aware. A small Teaching and Research Group is perhaps at the forefront of critical Environmental Education Research, a significant proportion of which is funded by state and federal government departments (SHEETRG, 1991).

There is an important argument here centring on contesting, rather than alternative, paradigms of Environmental Education Research. This reflects a parallel and related debate regarding a managerial versus political

economy approach to the environment and environmental policy (Redclift, 1986). But such is the relatively low state of Environmental Education Research in the UK that this debate has hardly begun here. Part of the problem is that there is no one journal devoted to monitoring and promoting Environmental Education Research.

Europe

The EC is showing renewed interest in funding Environmental Education Research, further to its innovative environmental education Network Project which ran successfully from 1977 for some ten years but with limited impact. The current 4th Action Plan, which includes funding for certain projects particularly in the formal education sector, follows the important EC *Resolution on Environmental Education* of May 1988.

Current projects include the *EC Diversity within Unity Project*, based at Sussex University, which at present involves institutions in some six European countries, looking at the implications of environmental education against an ethnographic background.

In Holland, a large research project funded by government on environmental education in the school curriculum is being conducted in support of the Dutch national strategy on environmental education - one of the few countries to have such a strategy.

International

The OECD is becoming a major player in Environmental Education Research funding both the *Environment and Schools Initiative* (ENSI), and baseline research on the effectiveness of environmental education in selected countries. Interestingly, the ENSI project combines the context specific emphasis of action research with the potential of international exchange and dissemination - a difficult but exciting combination. This is an important project which could have influential results, yet in the UK it is only properly active in Scotland, and only since 1990. However the

project's evaluation is being coordinated by the Centre for Applied Research in Education at UEA (Elliott, 1988).

Unesco-UNEP has been running an International Environmental Education Programme (IEEP) since 1975, which has included a strong element of research, development and information gathering. (Unesco, 1990 a). This programme could well be expanded after UNCED. Whilst much of this programme is country or region specific, many outcomes are potentially useful to developments in the UK. However, the IEEP has had relatively little impact in the UK - partly because its existence is relatively little known outside specialist environmental education circles and partly because of the difficulty of obtaining materials.

Needs and opportunities

The following needs are apparent, all of which warrant further thought, clearer definitions of priority for research and action.

- ◆ More research on areas of research need in order to establish priorities clearly and on the basis of evidence.
- ◆ Better exchange of information on Environmental Education Research, with a recognised centre coordinating such exchange. This should probably be CEE/SEEC.
- ◆ Better monitoring and dissemination of research findings.

The relative dearth of funds in environmental education means that it is all the more important that funds are well spent. Our record in building on the little research that has been done in the UK has been poor, partly because of the difficulty of tracking down research. This is a self-reinforcing tendency - and new researchers are dissuaded from entering the area.

There is a case for a journal of Environmental Education Research as present journals in

environmental education do not have enough capacity to carry full accounts of research.

- ◆ Better international cooperation and exchange.

Though there has been a degree of exchange particularly between the UK and continental Europe over the last decade, there is much room for improvement. There are some signs to this end - helped by the EC's interest, and a series of initiatives relating to encouraging environmental education in Central/Eastern Europe. Better channels of communication between the UK and the US and UK and Australia also need opening. One correspondent noted the difficulty of finding anything out about the quality and content of ERASMUS projects.

- ◆ More emphasis on and better design of evaluation within practical Environmental Education Research.

- ◆ More contact and dialogue between:

those experienced in educational research methods and those engaged in Environmental Education Research

researchers and practitioners. This is happening increasingly at curriculum development level.

environmental research/policy and Environmental Education Research/policy

- ◆ More recognition and support from statutory grant-making bodies, both in terms of making funding available and lending status to this area.
- ◆ More interest from academic centres, particularly those able to offer interdepartmental/interdisciplinary experience, and willing to work cross-sectorally, for example with

NGOs, industry, training bodies and institutions.

- ◆ More partnerships between academic centres who can offer academic and research expertise, and key voluntary bodies who can identify priority needs, are experienced in working collaboratively, and have extensive contacts with practitioners.
- ◆ Central monitoring of research initiatives and findings, including indexing of all major sources and journals.

At present, even the specialist environmental education journals are not properly indexed for research articles through lack of resources. The lack of monitoring means that we are not even making best use of the limited Environmental Education Research that already takes place. Neither are we fully capitalising on the considerable experience in environmental education that has been accumulated in the UK. In particular, there is not sufficient crossover of experience between those involved in environmental education, those involved in other areas of education, and those involved in environmental research and policy.

The overall need is for a Centre for Environmental Education Research which would probably be an additional role for an existing information centre. This would collect, monitor, disseminate, encourage and advise on Environmental Education Research. Support for the establishment of such centres has come from various sources including Unesco-UNEP (Unesco-UNEP, 1987, Unesco-UNEP, 1990b).

Priority areas for research

The two overall thrusts in research activity needed are baseline information, as shown in Adam Cade's paper, and action research.

Some Possible areas of research

- ◆ The cultural rather than scientific aspects of behaviour and environmental change - looking at historical, economic, political, cultural and ethical aspects. The whole issue of cultural identity is assuming more importance given the apparent rise of nationalism.
- Learning from indigenous cultures, particularly as regards sustainable lifestyles.
- The application of systems thinking to environmental education theory and practice. This would bridge holistic education and the need for ecologically sustainable political and economic systems.
- The current practice of environmental education in each education sector.
- The perception of environmental education by teachers and teacher educators.
- The evidence for attitudinal/behavioural change as a result of particular environmental education experiences, including the development of appropriate methodology.
- The strategies for change and integration within educational institutions.

Cautions and dangers

- ◆ Any development of Environmental Education Research should complement and support the overall pattern of development in environmental education as a whole, particularly as relates to the status of the environment and environmental policy.

- ◆ In order to guard against short-term opportunism, funds should support those institutions and researchers with proper expertise who can design a programme which meets real needs and involves dissemination. However, the value of action research which may be context specific rather than generalisable should be recognised.
- ◆ Researchers should demonstrate a willingness and capacity to engage in collaborative research. The integrative nature of environmental education needs real interdisciplinarity, but members of any team are often tempted to guard their own professional territory.
- ◆ The need to develop better evaluation and monitoring of environmental education practice as environmental education becomes more institutionalised has to be balanced against the danger of reducing the richness, creativity and diversity that has characterized good environmental education practice. Further, notice should be taken of the criticism of research which is over-instrumental and which could tip over into social control - thereby defeating a prime goal of environmental education which is to encourage critical thinking and autonomy.
- ◆ Efforts should be concentrated in closing any gap between Environmental Education Research and practice, either in the conduct of the research or in the use of findings.

Conclusion

Over the last 20 years environmental education has grown from a decentralized, heterogenous movement evolving towards one with many diverse approaches. This is largely true at all level - local community, national and international. However, this movement has for the most part subscribed and contributed to an

overall holistic philosophy and set of goals, seminally articulated at the Unesco Tbilisi conference of 1977.

This spontaneous approach has led to much good work. But if environmental and development education is instrumental in seeking and achieving sustainable development, as was suggested by the Secretary General of the Committee for UNCED in March 1991, the movement will need to run faster, with more direction and cohesiveness. But there is an important balance to be maintained here, between rapid growth and institutionalization and possible loss of energy, diversity and commitment. In maintaining this balance and supporting this growth, against the background of the UNCED debate and increasingly central environmental policy, research has a key and challenging role to play.

Measuring the state of environmental education

Adam Cade, Education Officer, English Nature

The proposition

We are at a watershed in environmental education. As we move from marginal status towards institutionalisation with much more universal practice we are searching to improve its quality and effectiveness. However there is no standardised gauge of these improvements - no widely used set of performance indicators or evaluation tools, no agreed standards of quality or national audit. Unless research is urgently carried out to find these indicators, the future health of environmental education is at risk.

Social science, especially educational, research may not have influenced many Government policies of late, but it is widely accepted that research that focuses on the tools and methods of evaluation have had relatively most political support, especially under a Labour government. (Pyke, 1991).

We need to search for these indicators as a way of taking stock of our investments in young people. We vitally need a tool-kit of diagnostic indicators to monitor the national health of environmental education.

We have:

- No uniform set of evaluation tools
- No set of performance indicators
- No system of comparison or replication
- No regular gauge of public opinion
- No national assessments of understanding or competence
- No national audit
- No agreed standards of quality

Could easily measured, standardised indicators of the state of environmental education be identified and trialled by researchers? Is this a priority for research in this area?

Research to find and trial meaningful indicators for State of Environmental Education Reporting will enable groups, governments, organisations, businesses as well as schools and colleges to regularly use these indicators. They will only then have the means of evaluating their own performance in environmental education as well as the state of environmental education at local and national levels.

It will provide:

- ◆ a common national framework
- ◆ a tool for self-evaluation
- ◆ accountability and access to information
- ◆ a political debating tool
- ◆ evidence for publicized claims
- ◆ a component of "state of the environment" reports/audits

- ◆ a way of judging the effectiveness of market-based approaches

This is especially timely with the imminent commercialisation of school and college inspections as well as with Government calls for accountability and access to information and the likely emphasis on education and training of the 1992 Earth Summit.

What needs to happen

Easily measured standardised indicators of the state of environmental education need to be identified by researchers so that comparisons can be made. These can draw on research tools used in the social sciences, and the evaluation of educational effectiveness, and be trialled with potential users. The indicators should be meaningful and easily gathered, especially if the collection and marshalling of data on the state of environmental education is to be systematic and regular, as is the case with other State of the Environment reporting.

Such research would allow governments, organisations, businesses and schools and colleges to evaluate their own performance in environmental education, as well as the state of environmental education at local and national levels. As well as practice, supporting services, such as the state of field centres or environmental information, should be monitored.

Groups who need evaluation tools and research:

- Educational institutions
- Voluntary organisations
- International organisations
- Businesses
- Statutory agencies
- Government departments

The benefits

There are various tangible benefits of such research.

- ◆ **A common national framework**

It could provide a baseline for future comparison of countries, regions, government and non-government sectors, and educational institutions over regular periods.

It can help assess the effectiveness of local and national environmental education programmes and policies.

It can identify gaps in provision and opportunities for partnership.

- ◆ **A tool for self-evaluation**

It can give an opportunity for observing feedback and effecting improvement.

It can help assess unexpected outcomes, such as the effect on vandalism or road safety.

- ◆ **Accountability and access to information**

It could give good information on real performance.

demonstrate the value of a programme or policy to funding bodies, the community, central and local government and other groups.

It could enable resources to be more efficiently used.

- ◆ **A political debating tool**

It can provide a sound basis for public and parliamentary debate.

In a political context, there are perhaps two types of research - that which informs new policy, and that which helps judge the effectiveness of new policy. The latter is popular politically, but needs to be developed with reference to environmental education and environmental policy. Indicators could

regularly provide information that would enable a more informed debate on government policy and priorities for funding.

International concern about environment and development is likely to put environmental education higher on the agenda of political debate over the next few years, at European and UK parliamentary levels. This will require sound baseline information.

It could provide a focus for the debate on commercial inspections.

The reorganisation of HMI means there is little chance of a national overview of the state of environmental education as currently the Department of Education and Science directly manages the national inspection of environmental education in schools, FHE colleges and the youth service. The CEE believes that this reorganisation would abandon any chance of a national overview of the State of Environmental Education by DES staff. However, so far, the HMIs have not developed any standard methods for regularly monitoring and evaluating the extent of environmental education in terms of funding, in-service training, access to and use of environmental information, sites and centres. There is an obvious opportunity for some enterprising organisation or team to plug this gap with sound, regular State of Environmental Education Reporting.

◆ **Evidence for publicized claims**

It can substantiate claims of success or failure.

For example, *This Common Inheritance: The First Year Report* claims that "the Government has placed the environment at the centre of its new initiatives in training, education and in research" (HM Government, 1991). Indicators and evaluation tools are needed by government in order to monitor the success of these initiatives, and by the educational community to assess the meaning of such claims. Equally unsubstantiated claims are often made by local authorities and voluntary organisations.

◆ **A component of State of the Environment reports/audits**

It should be a vital part of State of the Environment reports.

Education is an essential part of any environmental audit or State of the Environment report, as they should not just detail levels of air pollution or habitat change. These may be produced by local authorities, businesses or government departments. Some local authorities have led the way in reporting.

" Update on an annual basis, the section on the Environment in the Borough profile, to establish the progress being made."

(Chesterfield Borough Council, 1991)

As local education authority advisory teams are forced to become inspection teams, new opportunities are opened up for commercial State of Environmental Education reporting across the local authority.

A wider range of quantitative and qualitative indicators would enable government departments to have solid means of evaluating the impact of Chapter 17 Education and Training of *This Common Inheritance* (HM Government, 1990) over the next few years.

◆ **A way of judging the effectiveness of market based approaches**

It can provide evidence for weighing costs and benefits of environmental education.

The OECD have recently suggested that research is needed in order to identify the cost-benefits of environmental education (Schneider, 1990).

Support for assessing environmental education

Calls for measures of the development of environmental education include:

"Government, through central and local education authorities, should review the present state of environmental education."

"Systematic surveys should find out how well the principles of sustainability are understood." (IUCN, WWF, UNEP, 1991).

"Nominated Environment Ministers in each Government Department should publish an Annual Report on the State of Environmental Education."

"Their [local authorities] work should also be summarised in the Annual Report on the State of Environmental Education." (Cade, 1991)

Identifying indicators

Identifying the indicators and methods of monitoring will require specialist advice and a commitment to contribute to the research and trialling from a wide range of bodies. A wide variety of evaluation tools are needed, as environmental education is so relatively hard to identify.

Existing techniques available include:

- ◆ Questionnaires
- ◆ Opinion polls
- ◆ Group interviews
- ◆ Individual interviews
- ◆ Survey
- ◆ Desk study of documents, policies
- ◆ Before and after tests
- ◆ Observation of learners and providers

In terms of identifying indicators, models from other areas of market, social and economic, and educational research could be drawn on. The choice of indicators - and how and when they should be measured, and by whom - needs considerable thought and perhaps trialling. Some initial ideas are:

Understanding of the links between global issues and local commitment.

Opinions about the value of environmental education.

Staffing and funding levels for environmental education.

The proportion of schools, colleges and local authorities with posts of responsibility.

Specific references to environmental education in policies.

The proportion of curriculum time spent outside the classroom.

Perceived problems of integration.

Competence to recognise and identify contrasting environmental opinions.

The level of research on environmental education.

Number and range of environmental education services provided by centres such as museums, visitor centres, field and urban study centres.

Number and range of H₂ level courses which explicitly refer to competencies recognising the effect of human activity on the environment.

Number of local authorities with environmental education in their Environmental Action Plans/Charters/policies.

Cautions in using indicators

- ◆ Opinions based on environmental fears and concerns, are not necessarily proof of good environmental education. Constructive hopes for the future and celebrations of local environments are equally valid. Young people's opinions may often mirror those expressed by the TV media.

- ◆ Over-quantification, perhaps resulting from enthusiasm to produce good looking information, can give a false picture.

The outline of the Statistical Report described in the appendix of *This Common Inheritance* confirms that the DOE proposes to measure "Enr'ments in courses on environmental studies." Specific courses are not a good indicator of the State of Environmental Education as this runs counter to the notion of cross-curricularity and holistic approaches. Qualitative indicators offer one alternative.

- ◆ The most important indicators may be too difficult, complex or qualitative to identify - for example, those that look at the quality of environmental decision-making by individuals and local communities.
- ◆ The state of environmental education needs to be seen alongside reviews of the state of all education.
- ◆ Policy documents are not always reflected in practice.

The challenge to funders and researchers

A priority for research is to find and trial appropriate indicators of the state of environmental education. When the United Nations meets again after 1992 to discuss environment and development, we can only hope that more countries will be able to provide evidence of the state of environmental and development education in their national reports.

The old adage about research is relevant here - Politicians use research as a drunk uses a lamp post - for support rather than illumination. Many groups, as well as politicians, are likely to prefer support rather than illumination. Research is often used and

abused in a highly selective fashion in support of a particular viewpoint or policy. However in order to convert educational rhetoric into environmental action we need to put a regular spotlight on this thing called environmental education.

SECTION 3

S U M M A R I E S O F P R E S E N T A T I O N S

Policies, opinions and actions

Robin Grove White, Director of Centre for the Study of Environmental Change, Lancaster University

There are two ways of looking at environmental education as a research field.

- ◆ Environmental education as a resource available to society for helping to attune us to new objective environmental realities, and the immense problems they imply for the next century.

This approach entails its own research questions:

What is the extent to which adjustments are already underway in the educational system?

Which disciplinary definitions are dominant?

What is the appropriate balance between the practical and the conceptual?

- ◆ Environmental education in a broader contemporary cultural context - as part of new and complex interactions between worldwide environmental concern, the development of knowledge, and formal and informal modes of learning.

This approach builds on the significance of the environment as a gathering point for a range of contemporary human and social anxieties, which are beginning to have implications for the accepted architecture of our Western knowledge. Tensions surrounding questions of

scientific uncertainty, the issue of modernity/post-modernity, and new moral/religious configurations, as in certain aspects of the environmental phenomenon, are examples. Such emerging issues pose their own new challenges to human understanding, not least to the institutional bases of our formal educational systems. Research will need to focus on the strengths and weaknesses of disciplinary boundaries, the problems of interdisciplinarity, and our prevailing models of environmental education itself. These two approaches are not mutually exclusive, but they need equal attention. At times they may be in tension. But they underline the growing importance of the environment as a phenomenon for the future design of education.

Conclusions from an international survey

Jim Dunlop, Director - Overseas Courses, Jordanhill College, Glasgow

Despite the international prominence that is being accorded to environmental education, it seems as yet incapable of assuming a central position in the curriculum of educational systems in industrialised countries. Recent evidence gathered in 1991 during an enquiry requested by the Development Centre of OECD (Schneider, 1990) indicates that environmental education is still marginalised during a period when policy statements on significant environmental issues are being made at Ministerial level.

On the basis of this short survey, I offer three main conclusions:

- ◆ There is a gap between rhetoric and appropriate forms of action which requires to be bridged as a matter of urgency.
- ◆ There is a strong and growing case that environment should be given the status of a subject in the secondary school while continuing to be

accommodated as environmental studies in the primary school.

- ◆ Environmental education can only be cost-effective in the long term. One hopes there is time enough to support this assertion.

More detailed conclusions from the survey are as follows:

- ◆ If it is to be conducted properly, environmental education calls for a sincere and unequivocal realignment of educational philosophy.
- ◆ Environmental education should engage fully in the green debate and be prepared to help shift society's attitudes towards the sustainable society advocated in the Brundland Report. The emphasis should be on education for the environment.
- ◆ Only in the long term, during which the provision of substantial resources is assured, are the aims of environmental education likely to prove cost-effective.
- ◆ Defining the conditions for successful environmental education must go beyond the requirements of formal education, such as syllabi, timetabling, pedagogues and teacher education, to involve local communities, government at local and national levels, non-governmental organisations and the media. There is also a role for commercial and industrial interests. Better links between environmental education in formal education and these sectors will increase the credibility of environmental education.
- ◆ In secondary schools and in courses of teacher education, serious consideration should be given to the creation of the environment as a multidisciplinary subject able to absorb the diverse elements, complex

concerns and approaches which characterise environmental education. This would circumvent the complex management problems which beset interdisciplinary approaches.

- ◆ In raising awareness, there is a need to avoid producing 'awareness frustration' since the inability to act appropriately could be counter-productive.
- ◆ Creating awareness of environmental issues is not enough. Promoting understanding of environmental processes which equip people to make informed, environmentally sensitive decisions is required.
- ◆ Research should be conducted to introduce environmental education as a tool of environmental management as well as experiments which determine its cost-effectiveness over say a five year period.
- ◆ Whether environmental education as interpreted and practised in West European contexts can transfer to educational systems in developing countries has yet to be proven and merits fuller investigation.
- ◆ Environmental education may be subversive of established policies and practices. Its goal is to question values and alter attitudes in order to influence behaviour and action in the quest for a sustainable, equitable, global environment.

SECTION 4

WORKING GROUP REPORTS

Discussion on the objectives of the seminar was structured through focusing on research needs and priorities. Participants were divided into four working groups and given the following tasks.

You are members of a multidisciplinary research team who are bidding for funds to carry out either one or a range of research projects that would improve the quality and effectiveness of environmental education. Give a clear five minute presentation describing to potential funders the proposed research that needs to take place.

You are members of a committee set up to advise a funding body on how they could most effectively improve the quality of environmental education by providing funds for research. Give a clear five minute briefing describing to potential researchers the sort of research you might fund.

To help address these tasks, the following prompts were offered:

Benefits; opportunities; usefulness; applicability; uniqueness; timeliness; teamwork; collaboration; promotion; dissemination.

These tasks led to discussions about the nature of Environmental Education Research as well as future directions. These discussions are synthesised and summarised below:

The nature and context of Environmental Education Research

Research

The action research approach is most appropriate to the aims of environmental education. It can be critical, and has the potential to change structures in society. If a sustainable society requires social change, then action research may be one way of facilitating it.

Yet action research may not be favoured by funding bodies, including ESRC. They tend to prefer research which does not reveal, for example, issues of knowledge and power, but instead comments on the status quo. This raises questions on the institutional view of certain forms of research. The funding bodies should shift their criteria to include and encourage action research and experimental research. The acceptability of action research may be increased if presented as interactive.

Should research function within the constraints of formal structures, or seek to change them? Addressing the problems and issues of education within the framework of formal structures may be limiting. Change will not occur if it is carried out through structures which are themselves resistant to change. This is sometimes experienced through the stance of colleagues. For example, research-oriented colleagues may not see research on teaching materials as constituting proper research.

Environmental Education Research needs to be broadly based and concerned with content, process, outcomes and context. Taking one or two of these aspects only is not sufficient.

Indicators

Some participants saw performance indicators as inappropriate to the action research approach which generates its own meaning with regard to change. Qualitative indicators

were considered more appropriate. The development of content, process and outcomes with particular groups in particular contexts was seen by some as the essence of environmental education, as against the view that an Environmental Education Research programme is predetermined, carried out and evaluated against objective criteria.

The question of the cost-effectiveness of environmental education needs to be turned round. Is education without the environmental component cost-effective?

Interdisciplinarity

Interdisciplinarity is fundamental to environmental education. Yet individual academics are rarely required to teach outside their own disciplines. Why are isolated subjects so persistent when there is a strong call for merging? Why has interdisciplinarity not worked consistently when it has been advocated for so long? Has true interdisciplinarity ever occurred?

Part of the answer may be that it is impossible to be first class in more than one discipline, and so interdisciplinarity threatens academic prospects. The root of the problem lies with the balance power and knowledge, rather than management and content. This balance needs to be upset in favour of interdisciplinary contexts. Better insight and understanding of these contexts and on how knowledge is generated, structured and realised within them is needed if we are to be able to encourage the conditions under which interdisciplinarity works.

Interdisciplinary projects can be a powerful means of teaching environmental education, but tutors need to work more at discovering the conditions under which interdisciplinarity can work, and learning how people come to understand the environment and take informed decisions. Teachers and tutors do not receive explicit training as facilitators. They are often unaware of the pedagogy of asking the right questions, rather than giving the right answers.

Key areas for Environmental Education Research

Not enough is known about the effectiveness of different approaches to environmental education in the various formal and informal sectors of education. Research effort needs to be focused on this basic lack of understanding, and international comparisons made. Two broad areas of research activity, which could apply equally well to any form of environmental education and social group, are summarised below:

Perceptions of environmental educators about their goals

What are people engaged in environmental education actually setting out to accomplish?

What are their goals and desired outcomes?

What is the balance sought between awareness, knowledge, understanding, skills and capability?

Are programmes expressed in terms of content, purposes or both?

Are attitudinal or value shifts desired? How are these expressed? To what degree is education for the environment a clear-cut aim?

In what tangible form is this set out?

Are any actions specified which would make such education a reality?

What methodologies do environmental educators use to realise their aims?

Why are particular approaches used?

What theoretical and pragmatic issues inform choice?

What are the research conditions under which interdisciplinarity is successful?

How is the effectiveness or success of the programme measured?

What evidence is sought to illuminate the realisation of the outcomes?

How is that evidence arrived at, and what means are employed to evaluate it?

How effective are the programmes at realising the desired outcomes, and at generating other related outcomes?

What conclusions can be drawn about appropriate ways of achieving outcomes in terms of efficacy and cost-effectiveness?

What do we need to know about how people learn and the conditions under which their knowledge is generated?

How does this relate to conditions under which knowledge is expected to be used in relation to sustainability? For example, the Aids campaign was ineffective because the instigators had not looked at the context of people's lives.

Perceptions of those who have experienced environmental education about the nature of their knowledge, understanding, skills and attitudes.

How effective have environmental education programmes been in the eyes of those who have experienced them?

What is the nature of the learning which has resulted?

How has awareness changed?

What do individuals know and understand as a result of their experiences?

How have values and attitudes shifted?

What evidence can be adduced to validate claims made?

How has family life and working practices altered as a result to the environmental education which has been experienced?

What behavioural changes have resulted?

Why has this happened?

What approaches have had the greatest effectiveness? Why is this?

What constraints militate against the realisation of new personal and work-related goals? How can these be overcome?

Specifications for research

The point was made that lack of information about the state of research countrywide means that a broad information gathering exercise would be useful to allow some comparative work on applications for funding.

The summary below outlines criteria that the Groups suggested a funding body might use when considering an application. The points should be seen as interrelated.

Aims

Does it define its contribution to environmental education and its quality?

Does it have an interdisciplinary base?

Does it have clearly defined objectives?

Does it address priorities, in the light of current strengths and needs?

Does it have practical application?

Has it a transferable quality? Is the research likely to have a variety of applications?

Will it enhance overall research capability?

Does it address future needs as well as present ones?

Is there a training element? New researchers need support in this area.

Background and context

How does it relate to current national policies?

Does it allow for an international dimension?

What is the background of investigation in this area, and how does the proposal relate to it?

Does the work relate to sustainable development?

Methodology

Is the work practicable/possible?

What is the reliability and validity of the approaches suggested?

What evidence is there of innovation?

Will cooperative networks be used?

Will performance indicators or criteria be developed?

Evaluation

Will a sense of ownership among those who are the subject of evaluation be encouraged?

Will evaluation bear a clear relationship to the aims of the project, and has it been built in from the start of the project?

Does the design address activities such as field testing and behavioural change?

Will evaluation take account of both expected and unexpected outcomes?

Dissemination

Will dissemination be built in throughout?

Will outcomes be communicated to policy makers as well as practitioners?

Management structure

What is the timetable?

What is the composition of the managing team?

Will there be phased reports?

What evidence is there that the project will be effectively managed?

SECTION 5

DISCUSSION

Plenary discussion following the main presentations and Group reports ranged over the philosophical and practical issues surrounding Environmental Education Research.

Philosophical issues

This discussion centred on the paradigm that informs research. A number of comments reflected a difference in research paradigm that had emerged during the day. One paradigm might be termed an instrumentalist approach which tends to define the issues and design research to develop solutions, the effectiveness of which can be assessed through evaluation models including performance indicators.

Others saw this model of research as insufficiently critical of value structures and institutional structures which need to be changed in order to advance sustainability. They advocated a participative action research model which they said was more appropriate to the goals and methodology of environmental education. This involves learning about learning, about new appropriate forms of knowledge, and about the cultural context of change. Ultimately, this discussion was about the nature and role of environmental education. How far these approaches are complimentary and compatible, or antithetical was not settled.

Practical issues

Much discussion centred on how little is known about how people form their own knowledge base and values, and how research on these areas might affect the development of environmental education.

There was a concern that Environmental Education Research should properly address sectors outside formal education and particularly schools. The media especially was

seen as an important target and vehicle for environmental education. The view was expressed that environmental education needed to be evaluated under unfavourable conditions as well as conditions optimal to its success.

SECTION 6

CONCLUSIONS

Chairman's closing observations

Michael Redclift ended the seminar by suggesting a number of areas where environmental education needs to make a contribution or pay more emphasis:

Globalisation

What is needed for environmental education to throw light on global environmental change, particularly in terms of local action and global consequences? Does environmental education sufficiently address the globalisation of many areas of life, for example consumerism, business and tourism?

Sustainability

Does environmental education address the meaning and implications of sustainability for people's lives and decisions?

Gender

How far should environmental education connect with the gender discourse that, for example, is particularly to the fore in the development debate?

Paradigms and culture

There is a convergence of concern about the environment and also about the need for environmental education, but this concern is also marked by contesting paradigms. Environmental educationists need to be aware of these differences, and explore and test different approaches. In sum, environmental education must be conducted in relation to culture and this must include the educational institution responsible for teaching or research.

Broad conclusions

Whilst specific recommendations did not emerge from the plenary, certain broad conclusions may be drawn from the seminar.

◆ Environmental Education Research has been underrepresented in the UK, particularly in comparison with other developed countries. Little research on environmental education has been carried out by UK universities, with a few noteworthy exceptions. Unlike several European and North American universities there is still no chair of environmental education in a UK university or polytechnic.

◆ The exchange of information in Environmental Education Research both within the UK and internationally is poor, and mechanisms need to be identified or established which can rectify this situation. Networks, an information clearinghouse and a research-orientated journal for the UK or Europe could help build more effective 'exchange of information.

◆ Collaboration in research at all levels, interdepartmental, institutional, national and international needs to be encouraged. Environmental education research would benefit from the erosion of many of the institutional and departmental barriers within and between academic institutions. Research teams that can attract new disciplines such as psychology or economics can add to the quality of research. New partnerships between academic institutions and voluntary organisations as well as business would also benefit this sort of research.

◆ The funding and encouragement of Environmental Education Research has been inadequate for the last two decades. Funding needs to be dedicated to this area if it is to progress. The lead taken by the Economic and Social Research Council in this respect provides a useful model for other agencies and Government Departments to follow. International collaboration by funders could develop with international Environmental

education agencies, the European Commission, UNESCO, UNEP and OECD. Shared funding of this sort is likely to be encouraged by the Earth Summit in 1992.

◆ The urgency of environmental issues and environmental policy requires that a new emphasis and interest is put into Environmental Education Research to inform and guide national policy-makers. At the same time action - orientated research can provide an effective way of helping to translate worthy rhetoric into grassroots practice, which can meet the needs of both educators and learners.

APPENDICES

APPENDIX 1

Review of General Research

This is a supplement to the paper on page 4 by Stephen Sterling.

The need for research into aspects of environmental education was recognised in the early 70s, corresponding with the rapid growth of interest in environmental education that characterized that time. But this early momentum did not lead to any coherency in planning, provision or funding of Environmental Education Research over ensuing years.

One outcome was the first large-scale Environmental Education Research programme based at University of Sussex 1974-77 and funded by Leverhulme Trust. A number of interim reports were produced but a final report was never completed. This may have adversely affected the status and likelihood of further serious Environmental Education Research in the UK for some time thereafter.

Research in environmental education in the United States however became quite well established from this period, boosted by the Environmental Education Act of 1970, and it was an American based study conducted by Richmond and Morgan in 1977 of British schools that stood as a lone example of a properly planned research study in the UK for many years (Richmond, Morgan, 1977).

For some twenty years in the UK, there has been no systematic national monitoring of Environmental Education Research. The Council for Environmental Education had a research panel in the mid seventies, but lack of time and funding prevented the systematic recording, evaluation, and monitoring of Environmental Education Research, or identification of priorities. A register of Environmental Education Research compiled and published by CEE in 1984 was not maintained (Sterling, 1984). A one-off

research project funded by the Scottish Office Education Department for the Scottish EE Council is the most recent useful summary but is not generally available (SEEC, 1991).

A brief summary of involvement by key sectors follows.

Academic involvement

The *Conservation and Development Programme for the UK* (Baines, 1983) stated "there is a dearth of research data by which educators can evaluate the success of environmental education programmes." Despite its recommendation that there should be "an academic power base for environmental education which would carry out research and advanced training and assist the progress of an interdisciplinary approach to environmental education", no single recognised base emerged in the succeeding years which would help systematically remedy the deficiency which the Programme had identified.

Without strong academic commitment, Environmental Education Research has been conducted through diffuse channels. There has been a continuing trickle of research degree theses at various institutions, but with the exception of the two main general registers of educational research continuing, this work has not been centrally monitored, collected or disseminated.

As far as it has been able to ascertain, there is only one PhD student in environmental education in England at present. Volume 8 of the National Foundation for Educational Research's (NFER) Register of Educational Research (NFER, in prep) lists only eight projects having keywords Environmental Education or Environmental Studies.

Institutions to the fore in Environmental Education Research include Reading and Salford universities, and latterly Sussex, Durham and Stirling - but in each case the research commitment centres on small numbers of individuals rather than being the

prime interest of whole departments. Nationally, it amounts to a handful of people involved in this area of education; yet this is an area which is likely to be endorsed by UNCED as critical to achieving sustainability! However, whereas the main problem in the past has been the low level of awareness and interest amongst academics, the main obstacle now to a greater level of activity is more probably related to resources than interest.

Local authorities

Another channel has been local education authorities, which have initiated and funded such areas as local curriculum development, and production of resources, sometimes through teacher secondment. Latterly, a number of authorities have developed environmental education policies, sometimes supporting an authority environmental policy or green strategy and audit. Despite other current threats to environmental education provision at local authority level, the environmental strategy offers much potential in bringing together good education, environmental action and evaluation.

Some local authorities have supported imaginative curriculum projects such as the Hertfordshire/Norway link on environmental issues. Indeed, the development of environmental education and methodologies within the learning situation is an approach to Environmental Education Research which is gaining ground.

Voluntary sector

With the relatively low level of interest and activity in Environmental Education Research in the statutory and academic sectors over past years, voluntary organisations have occupied important ground in initiating, obtaining contracts, and where possible monitoring Environmental Education Research. The Council for Environmental Education has been notable in this regard. Although it has not been able to mount a systematic research monitoring and steering programme, the research it has been engaged in - as with other

voluntary organisations - has been in direct response to perceived needs. The same can be said of CEF's counterpart in Scotland - the Scottish EE Council which has instigated a series of research projects on the needs and roles of FHE, industry and commerce and professional institutions, funded by Scottish Enterprise and WWF (UK).

WWF (UK) has made a very significant contribution to innovative curriculum development in the formal education sector. For some years, WWF has funded a large number of such projects at any one time. They have also put funding into areas such as effectiveness, status of and perception in environmental education - including the three year Global Impact study conducted by the Centre for Global Education. This study represented the largest single budget in Environmental Education Research since the Leverhulme study of 1974. WWF's role has been all the more critical given the relative lack of funding from other sources: a fact which has meant that worthy projects unable to be picked up by the Fund have sometimes failed in the past due to lack of alternative sources.

Of other voluntary organisations, the Tidy Britain Group has consistently conducted curriculum development based on research into needs, perceptions, and responses of teachers and learners. (For example, Mares, Harris, 1987). All its materials are carefully evaluated, something which is certainly not true of all environmental education materials that are produced.

WATCH, through such nationwide projects as Acid Drops, the Ozone Project and Riverwatch provides an example of environmental education practice which combines with useful environmental research which also potentially affects environmental policy.

Statutory sector - Agencies

The old Schools Council played an important role in curriculum development in environmental education up to 1982, and many

of the ideas and techniques developed in Schools Council projects became embedded in environmental education theory and practice. Projects include *Environmental Studies Project 5-13*, *Project Environment*, *Science 5-13*, *Geography 16-19*, and *Art and the Built Environment*.

The former Nature Conservancy Council had some limited involvement with Environmental Education Research and English Nature is presently engaged in a research project relating to business initiative with the CBI. It has also contracted the NFER to assess the extent to which grant-aided school nature areas have raised both the quality of environmental education and children's level of awareness of conservation (NFER, 1992).

Statutory sector - Departments

It has to be said that the Department of Education and Science have had very little direct involvement or apparent interest in Environmental Education Research for many years. A review of environmental education and directory of sources was published in 1981, but this was based on limited evidence, and the exercise was never repeated (DES, 1981). One notable research project part funded by the DES was the three year Learning through Landscapes study, which reported in 1989. For some years, HMI reports on environmental education practice in specific institutions were a useful source of information as was the HMI survey of outdoor education and short-stay residential experience (HMI, 1983), but such reports have been scarce, and no systematic assessment framework is apparent.

The Department of Environment have demonstrated a greater degree of interest and involvement in Environmental Education Research over the years. It set up an Environment Board in the late seventies, but this was dissolved after its report on urban study centres Environmental Education in Urban Areas (DoE, 1980).

In the 1980s, the DoE were involved in funding other research related to environmental education (Gayford, 1987, Matthrani, 1987), but this modest involvement appears to have declined in recent years.

The present prospect is better, however with the impetus of the White Paper on the Environment and succeeding annual reviews, and the UNCED process providing a more promising climate for funding in environmental education.

APPENDIX 2

Review of Evaluative Research

This is a supplement to the paper on page 10 by Adam Cade.

Over the last 20 years, several researchers have evaluated the national state of environmental education. Several snapshot national evaluations have surveyed a particular aspect of the state of environmental education at one time and one level. However no evaluations have looked at all levels of environmental education or been regularly replicated for comparison.

Only one national survey of environmental education has been repeated using similar indicators. The Conservation Trust used interviews and questionnaire to carry out a comprehensive evaluation of opinion, provision and problems related to environmental education in 420 secondary schools in the UK, in 1973. The 1973 survey was repeated, but only in 1978 (Berry, 1974 and Williams, 1978).

The DES published a snapshot of the state of environmental education in 1981 (DES, 1981). However the comprehensive national review lacked the punch and rigour of a critical evaluation and it has not been repeated. With the commercialisation of school and college inspection such a national overview may never be written and published by DES staff.

The DOE has put considerable efforts into some snapshot national evaluations. Most notably, the evaluation of *Environmental Education and Training in Industry* carried out by Shireen Matthrani and CEE in 1987 (Matthrani, 1987). This research illustrates how a government department has already carried out some sort of critical evaluation of the state of environmental education, albeit at one level. However it also unfortunately illustrates how good research has not been widely promoted or disseminated. Four years on, it is now likely to be of particular relevance to the DES Expert Committee on

Environmental Education if they are told about it!

Matthrani's report involved a detailed postal questionnaire survey of 455 companies in 19 broad industrial sectors. The respondents were senior or middle managers, 40% of whom responded.

Only a third had some environmental education at some time but two thirds felt that environmental education helped with compliance and understanding. Less than a third had environmental matters in their education or training policy. Only two thirds had any staff responsible for environmental matters. Managers in large companies received most environmental education and external short courses were the most popular form of education. Most of the education focused on scientific and technical understanding rather than considering and clarifying values.

Probably one of the most comprehensive snapshots of the state of environmental education was done in 1987, even though it just looked at schools, and perceptions rather than practice. The *First Year Report of the Global Impact Project* used interviews and questionnaires with educators as well as organisations concerned with environment and development (Greig, Pike and Selby, 1987).

Several research teams, such as the Children's Learning in Science Project (CLISP) at Leeds University, and market research organisations, such as MORI and the Henley Forecasting Centre, have looked at the level of environmental understanding and opinions in young people. Unfortunately, young people's environmental concerns were not comprehensively evaluated in the DES's *Young people in the 80's survey* (DES, 1983).

Following the Environment White Paper, the Policy Studies Institute carried out a brief evaluation of the state of environmental education policies in 56 government departments, statutory agencies, public sector bodies and local government associations (Hutchison, 1991). It would be interesting to

conduct a follow-up in about two years time to evaluate the influence of the White Paper in this area.

On the international front, Canada and Australia have shown that they are giving serious consideration to evaluating the state of environmental education as a way of informing key policy-makers and educators.

The Quebec State of Canada has recently published a report in French which comprehensively evaluates the state of environmental education at primary and secondary school levels (Ministry of the Environment, Quebec, 1991).

One of the National Collaborative Curriculum Projects between the States in Australia is the mapping of the environmental education curriculum. The leader of the mapping team describes mapping as a description of what is, using a questionnaire and survey form as instruments. For example the survey form asks headteachers to "Quote the advice provided regarding student participation in environmental action." This audit will, in turn, help to describe the national curriculum where Studies of Society and Environment are one of seven mandatory curriculum areas - similar to Northern Ireland!

APPENDIX 3

International Research Programmes

Commission of the European Communities

The CEC policy on research is guided by the 1988 Resolution on Environmental Education. It identified a range of priority activities for Member States and added that, "It would appear appropriate to prepare, implement and improve these priority activities with the help of pilot and research projects."

- ◆ Networks in the EC for environmental education

This research was carried out for the CEC by Christine Haffner of Resideau IDEE, based in Brussels. The short, fact-finding study looked at international, national and local networks for environmental education in the European Community. It also investigated the potential of establishing a European network as well as supporting existing networks. The preliminary study will be discussed with Member States before considering whether a wider seminar is necessary. These networks could enable research collaboration, dissemination and exchange to take place.

- ◆ Training in the Environmental Field

This more extensive research was carried out by James Medhurst of Ecotec Research and Consulting Ltd, Birmingham and published by Ecotec and CEC in Sept 1988. The report aimed "to examine by descriptive analysis the need for training, notably for professionals, which is requested for the conservation and improvement of the environment."

- ◆ Sources of information on European Education and Training

EURYDICE is the Education Information Network in the European Community. Its use is limited to policy makers. The UK EURYDICE network information Unit is based at the National Foundation for Educational Research.

CEDEFOP is the European Centre for the Development of Vocational Training. The CEDEFOP documentary network national correspondent is Mr Basil Murphy based at the British Association for Commercial and Industrial Education in London.

◆ The future

The EC 5th Environmental Action Plan is likely to be confirmed in early 1992. However certain areas are being informally discussed by the Commission, especially:

- ◆ Ways of facilitating the flow of information, possibly by the creation or support of networks.
- ◆ Ways of improving research, possibly by encouraging cooperation between university researchers and educators.
- ◆ Ways of improving the training of teachers, possibly by a module of European training.

This has still to be formally confirmed with Member States.

A new budget line for environmental education will be confirmed in early 1993 as part of the 5th Environmental Action Plan.

Contact: Monsieur Giles Vincent, Head of Environmental Education and Training or Mme Annie Binarous, Environmental Education Officer, Directorate-General 11 Environment, Nuclear Safety and Civil Protection.

UNESCO-UNEP

The International Directory of institutions active in the field of environmental education was revised in 1989. It lists about 300 international organisations and institutions involved in Environmental Education Research. It is published as part of the UNESCO - UNEP International Environmental Education Programme (IEEP).

Environmental Education: Selected activities of UNESCO-UNEP International Environmental Education Programme 1975-1990, (UNESCO. 1990) gives a summary of their work including some research projects.

Contact: Dr Abdul Ghafor Ghaznawi, International Environmental Education Programme, UNESCO, Division of Science, Technical and Environmental Education, 7 Place de Fontenoy, 75700 Paris, FRANCE

APPENDIX 4

Sources of Funding

Over the last 10 years funding for research on environmental education has come from a range of government departments, statutory agencies, international bodies and voluntary organisations. Some bodies, such as the ESRC and CEC, have specifically sought bids for funding research.

Global Environmental Change Programme

The Economic and Social Research Council launched a new Research Initiative in April 1991. The selection of research proposals under the first phase took place in July 1991. The budget for the GEC programme is approximately £20 million. Professor Michael Redclift is the coordinator of this Research Initiative.

Contact: Martin Quinn, Global Environmental Change Programme, Economic and Social Research Council, Polaris House, North Star Avenue, Swindon SN2 1UJ 0793 413 049

Environmental Grant Fund

The Department of the Environment set this fund up for voluntary organisations in 1990 to pursue the proposals in the Environment White Paper. £650,000 was allocated for the first year. One million pounds has recently been confirmed as the allocation for the second year of the fund which will be aimed at local and national voluntary organisations.

Contact: Colin Morris, Room A303, Department of the Environment, Romney House, 43 Marsham Street, London SW1 3PY 071 276 8530

Special Grants Programme

The Department of the Environment also gives Project grants which enable voluntary organisations to undertake innovatory or experimental projects of national significance relevant to DOE's interests.

Contact: Gary Messenger, Directorate of Rural Affairs, Department of the Environment, 2 Marsham Street, London SW1P 3EB 071 276 4568

The Research and Development Programme of the DOE

The Chief Scientist Group has included some research on environmental education and training, notably research on industry carried out by the CEE.

Contact: Mr Davis, Chief Scientists Directorate, Department of the Environment, Marsham Street, London SW1P 3EB 071 276 8365

NVYO Grants

The Department of Education and Science, Youth Service Unit publishes an annual Grant Memorandum which lists about 70 eligible National Voluntary Youth Organisations. Some funds are available for innovatory projects.

Contact: David Barwick, Youth Service Unit, Department of Education and Science, Sanctuary Buildings, Great Smith Street, London SW1P 3BT. 071 925 5238

R and D: Support for Training and Mobility of Research Workers

Directorate-General 12 of the Commission of the European Communities provides funds to bring researchers together throughout the EC.

Environmental Education and Training Fund

Directorate-General 11 - Environment, Nuclear Safety and Civil Protection provides funds through Budget line 6619 following the 1988 Resolution and the 1990 Commission report on Training in the Environmental Field. A new budget line for environmental education will be confirmed in early 1992 as part of the 5th Environmental Action Plan.

Contact: Gille Vincent, Head of Environmental Education and Training, Commission of the European Communities, DG XI, C/4 Batiment Breydel, 5/203 B-040 Brussels, BELGIUM. 010 322 235 3874

The Task Force for Human Resources, Education, Training and Youth Schemes

Several educational funds relevant to research are managed by the Task Force but funded by Directorate-General 5 - Employment, Industrial Relations and Social Affairs. They include PETRA, EUROTECNET, ERASMUS, COMETT and ARION, details of these are available in the separate abstract.

OECD Research and Development

The Centre for Research and Innovation (CERI) in Paris has funded a number of research projects on environmental education, especially the Environments and Schools Initiative.

Contact: Mme Katherine Kelley-Laine, Project Officer, Organisation for Economic Cooperation and Development, 2 Rue Andre-Pascal, 75775 Paris, FRANCE
010 331 45 24 82 00

WWF-UK

The WWF-UK has funded a number of research projects as part of its publication programme, especially the Global Impacts Project carried out by the Centre for Global Education, based at York University.

Contact: Peter Martin, Head of Education, WWF-UK, Panda House, Weyside Park, Godalming, Surrey GU7 1XR 0483 426 444

Council of Europe

The Council of Europe has funded an Expert Committee on Environmental Education and Agriculture, which carried out some limited research.

Contact: Françoise Bauer, Environment Division, Council of Europe, Boite Postale 431 R6, 67006 Strasbourg Cedex, FRANCE
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APPENDIX 7

List of Participants

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The Economic and Social Research Council aims to increase understanding of social and economic change. It supports the highest quality social science, often of an interdisciplinary nature, in universities, polytechnics and independent research centres in the UK. Through this it aims to increase the skill and expertise of social scientists, their techniques and available resources, and win wider recognition for the value of social scientific research.

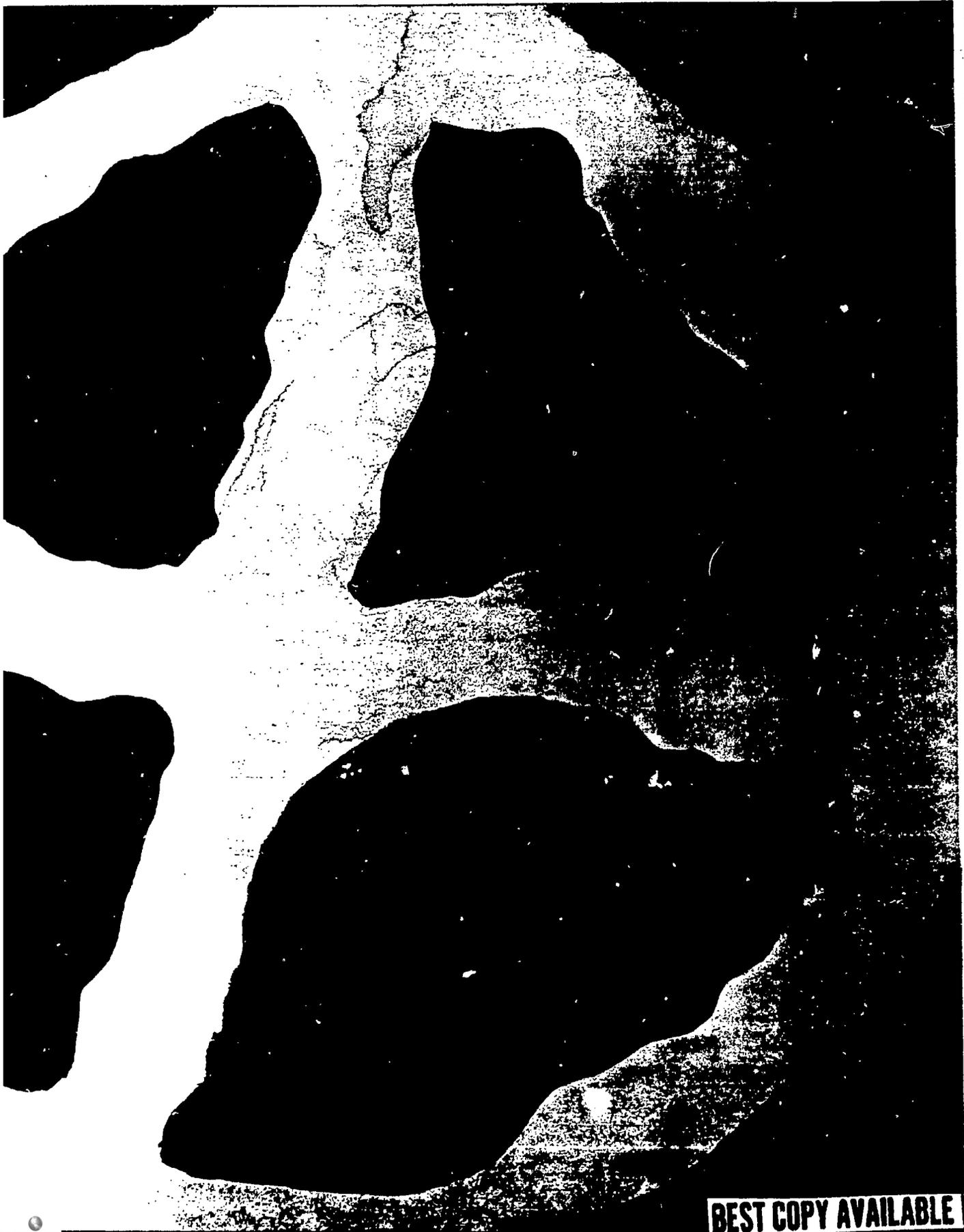


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**Global
Environmental
Change**

**ESRC Research Programme into
Global Environmental Change**



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Changes to the global environment are one of the major challenges facing the world today. Under the auspices of a ten-year £20m Economic and Social Research Council-funded programme, the Global Environmental Change (GEC) Programme, UK social scientists are playing an important part in understanding the driving forces behind such changes and determining suitable policy objectives to avert environmental disaster. The doomsday scenario is that by the time science has determined how detrimental human activity has been on the environment it will be too late to take remedial action.

Investigating climate change impacts

CSERGE researchers are focusing on the cost of environmental damage resulting from climatic changes. One research team is investigating the incentives for international agreements on greenhouse gas emissions and the methods for securing them. Another CSERGE team is examining species and habitats reduction and is seeking ways to curb such losses. While, in a bid to develop a more secure basis for international agreements, a third theme for CSERGE research focuses on how global changes affect the perception and responses of governments and other agencies.

Complementing the work at CSERGE, UK social scientists elsewhere are looking at the problem of greenhouse gases and carbon dioxide emissions. ESRC-funded researchers at Birmingham University are developing practical methods to measure greenhouse gas abatements, while a team at the

ESRC Research Programme into Global Environment

Can people be persuaded to make changes in behaviour – through reducing consumption, recycling or conserving resources? How do people assess the impact of their activities on the environment? Are they prepared to make sacrifices for the environmental good?

With so much uncertainty about the state of the environment, the ESRC wants answers to the following questions: can people be persuaded to make changes in behaviour – through reducing consumption, recycling, conservation? How do people assess the impact of their activities on the environment? Are they prepared to make sacrifices for the environmental good? The social sciences can help explain the link between individual and collective behaviour.

The Research Programme

So far, under Phase 1, the ESRC is funding 15 research groups throughout the UK. The first three research priorities identified by the ESRC in its GEC Programme are:

- environmental change and public policy in the UK and European Community (EC)
- international agreements and environmental policy
- the causes and effects of GEC in three critical zones: the tropical forests, Africa and the Arctic.

Also, under the GEC Programme the ESRC has funded the establishment of a Centre for Socio-Economic Research on the Global Environment (CSERGE) at University College London and the University of East Anglia.

In the second phase of the programme, priority research themes will be the adoption of clean technologies by industry and demographic change, and their relationship to global environmental change. In addition, ten fellowship awards have been made for researchers to undertake basic theoretical and conceptual studies of global environmental change issues.

London Business School studies the design and impact of international carbon dioxide agreements, and a group at Southampton University looks at the international trade implications of environment policies.

The GEC Programme has recognised that pollution is no respecter of international borders and funds projects focusing specifically on the conditions that will be required for future global agreements. Researchers at the Science Policy Research Unit at Sussex University, for example, are investigating the way the Intergovernmental Panel on Climate Change has advised governments. One of the major problems associated with any form of international agreement, however, is identifying whether or not promises of action are being kept. Using arms limitation and Montrea: Protocol agreements as models. Bradford University researchers are working on answers to the difficult questions of verification and information exchange that will be posed by international agreements on global warming. Similarly, researchers at Lancaster University have received funding under Phase 1 for a Centre for the Study of Environmental Change (CSEC) which will be concerned with the process of translating scientific understanding into public policy. In several related projects, the Lancaster-based team is investigating how environmental policies are developed in a bid to identify the human logic involved in their management.

Impact of Rio on developing economies

Much of the initial environmental debate has been concentrated in the older industrialised nations, but it is increasingly clear that progress is impossible without the support and commitment of the developing nations. Researchers at Glasgow University are investigating the possible impact that decisions made at the Earth Summit in Rio will have on the environmental policies of selected Latin American countries. Some GEC projects are specifically addressing issues of global change as they affect the environments of developing countries. Tropical forest destruction is, not surprisingly, high on the agenda, with groups looking at Borneo and West Africa and determining what conservation means to the people there.

I Change

Increasing desertification is also of major concern. Three GEC projects, already under way, are examining the circumstances under which desertification occurs in the Sahelian zone, and immediate areas to the south. More specifically, researchers at Cambridge University, in collaboration with SOS Sahel, are looking at the role of women as environmental managers. Researchers will examine the current distribution of households, how natural resources are being managed and how they will adapt to environmental changes.

Closer to home, Cambridge also houses a team investigating policy options for sustainable energy use within the UK economy. This research falls within a number of UK and EC-orientated projects focusing on specific areas such as energy, the construction industry and agricultural land use. Other teams are looking at options for energy saving in buildings and the impact potential climatic change may have on British land use. And the GEC Programme is partly funding the new ESRC Programme on transport and the environment.

Most importantly, the ESRC is making efforts to ensure that its own work is not conducted in intellectual isolation but is part of a multi-disciplinary approach tackling challenges facing the global community. The ESRC believes the social sciences should help to set the science agenda on global change and not simply react to it. The Council is taking great steps to ensure that the social sciences help to establish the causes of change as well as the impact. Social scientists can enhance the debate by proposing policy and behavioural changes that reduce the human contribution to environmental problems.

Working with other Research Councils and government departments

The multi-disciplinary approach is already taking shape. The GEC Programme is closely linked to the initiatives of other UK Research Councils. Research funded by the Natural Environment Research Council (NERC), under the auspices of its Terrestrial Initiative in Global Environmental Research (TIGER), is expected to feed into the GEC Programme. TIGER projects are focusing on the impact of global warming on ecosystems and the sensitivity of UK plant and animal species to climate changes.

Similarly, there is potential cross-over between the GEC Programme and projects being considered by the Medical Research Council (MRC) and the Science and Engineering Research Council (SERC). It is envisaged that the ESRC and MRC will be able to collaborate on the impact on health of global environmental change, while the need to develop and utilise cleaner technologies is a concern shared by the ESRC and SERC. Consequently, the Research Councils are working to develop such collaborations and these will be the major focus for Phase 3 of the GEC Programme.

The Research Councils and government departments and agencies co-ordinate their research programmes through the Inter-Agency Committee on Global Environmental Change (IACGEC). Among the developments initiated by the IACGEC is the establishment of a global environmental change data network facility which is managed by the ESRC. This facility seeks to link UK data centres which hold data relevant to GEC and provide a 'Master Directory' service for users in the natural and social sciences who need this data for their research.

Sustainable development, which allows the needs of today to be met without compromising the needs of future generations, is the stated goal of many governments and the ESRC intends to play its part in finding ways of ensuring that it is achieved. Future efforts will focus on issues such as policies to curb biodiversity reduction and study the social and environmental consequences that may arise from genetic modification of plants and animals. Social scientists also have an important role in the control of air and water pollution. The ESRC intends to target the problems of air and water quality in Eastern Europe specifically.

Future ESRC research will also be targeted on the links between poverty and the environment in the developing nations of the south. Economic growth is required to alleviate poverty but it is important to make sure that the environmental degradation that accompanied industrialisation in the richer countries is not repeated in the south. The key to sustainable development is not to produce less but to produce differently. After jointly commissioning a desk study with the Overseas Development Administration

on the problems associated with poverty, debt and resource degradation, the ESRC intends to fund research into the links between poverty and the environment.

This desk study was just one of a series commissioned by ESRC and government departments, principally the Department of the Environment, to establish the priorities for a global environmental change research agenda.

International collaboration

UK social science is at the forefront of international efforts to tackle the challenges of global environmental change. But the ESRC recognises that this cannot be conducted in geographical isolation and is already making moves to develop greater international collaboration. Meetings have been held, and more are planned, with the French, Dutch and Germans to ensure that the GEC Programme does not duplicate their efforts. British researchers, through initiatives such as the EC's Framework Programme are collaborating more and more with their Continental counterparts and such international links form a major part of the ESRC's 1992 - 1997 Corporate Plan.

Beyond its links with European researchers, the ESRC is co-ordinating its activities with worldwide social science research on global environmental change through the Human Dimensions Programme of the International Social Science Council.

The challenge is to beat the biggest problem we have yet encountered; how to live and develop more sustainably. Future generations will judge us by our willingness and ability to act decisively, now.



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