

SCAN: A Wider Perspective

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1.0 INTRODUCTION

Happy, truly, is the naturalist. He has no time for melancholy dreams. The earth becomes to him transparent; everywhere he sees significancies, harmonies, laws, chains of cause and effect endlessly interlinked, which draw him out of the narrow sphere of self-interest and self-pleasing, into a pure and wholesome region of solemn joy and wonder.

Charles Kingsley: 'Glaucus; or the Wonders of the Shore', (1855)

This collection of information, ideas and practical suggestions, points to a revival in nature study, stimulated, paradoxically, by political commitments made by the majority of world leaders at Rio to set up expert panels to produce, and manage inventories of local wildlife.

Educationalists of the mid-nineteenth century, such as Charles Kingsley, were responsible for setting a long lasting biological agenda for school work which stressed the importance of seeking 'wonder in every insect, sublimity in every hedgerow, past worlds in every pebble, and boundless fertility upon the barren shore'. This broad philosophy from an age of serendipity, and education for its own sake, is now all but played out. The time, budgetary and subject constraints of a national curriculum, the imagined dangers of being outdoors, media hype of endangered global ecosystems, and above all, the emphasis on molecules rather than organisms, have produced a generation of class-bound teachers. Experts are now required to provide their school with a nature walk, and work sheets about its commonplace plants and animals.

The UK biodiversity action plan encourages any initiatives that promote community understanding of biodiversity, particularly if this leads to action to conserve and increase the variety of common local plants and animals. At school, this does not just mean finding organisms that are survivors from habitats once commonplace. Indeed, the dangers in this 'indicators of ancient woodland' approach are that children who cannot find anything to put in their tick boxes will be confirmed in the view that their neighbourhood has no value. Other problems with children listing 'local biodiversity' for delivery to professional planners, are inconsistencies in mapping and identification due to lack of continuity of recording skills on the part of both teachers and pupils.

This problem was highlighted in the biodiversity action plan from the voluntary sector. "Knowing whether site-based monitoring objectives are being achieved requires a national projected areas monitoring programme, professionally co-ordinated for UK wide consistency". There is little sign that such a national framework will be produced quickly to support local monitoring.

Then there are more fundamental questions about what the information is to be used for. From an educational perspective, effort put into making species lists has greater interactive value when owned by the community and used to make management plans involving the recorders in local action to improve things. The latter point highlights a danger, that using children to monitor sites outside the influence of the school and its community, will turn them from deficiencies in the gardens, parks, wastelands and footpaths they encounter everyday. From this point of view, towns and cities pose the greatest challenges to the promotion of biodiversity education.

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Agenda 21 is about getting involved to improve your local patch. If children are to be taken out of school, there is a strong argument that it would be a far better use of limited resources to provide a framework for them to interrogate their local council's plans for its open spaces. In this way they could come to grips with the day to day problems, issues and challenges of wildlife management in the heart of their community. This experience would probably equip them to help plan and manage their own patch, at school, or in their own backyards.

SCAN's message is that nature everywhere has something special about it. There are really many different approaches and methods, to enhance children's understanding of what is special about their neighbourhood. They should all be encouraged. Many are traditional ways to study local wildlife that go back to the age of the pioneer nature watchers, such as Gilbert White, Charles Darwin and Charles Kingsley. A nature diary, perhaps with a modern emphasis on IT reporting/communication, is a minimum effort revival. Powerful expressions of local biodiversity may also come through creative writing, art and drama. In this respect, the following pages provide a comprehensive knowledge system about biodiversity in the context of sustainable development, and review best practice as this is emerging through the application and inventiveness of SCAN teachers.

SCAN is there to stimulate flows of information, methods, ideas and data; teacher to teacher; and pupil to pupil .

Denis Bellamy
'SCAN' Co-ordinator

2.0 PEOPLE AND NATURE

Inspired by the essay of Barry Lopez * reflecting on the impact of the voyage of Christopher Columbus, "The Rediscovery of North America" University Press of Kentucky, (1990).

"There were more than a thousand distinct cultures, a thousand mutually unintelligible languages, a thousand ways of knowing. How can one compare intimacy with the facets of this knowledge to the possession of gold? How could we have squandered such wisdom in that search.

It would take a lifetime to list the trees and flowers, the butterflies and fish, the small mammals, the kinds of deer and cats, the migratory and resident birds; and to say the most rudimentary things about their relationships, how they know and reflect each other. This, along with the people, we ignored. it was a wealth that didn't register until much of it was gone, or until, like the people, it was a tattered, diluted remnant, sequestered on a reservation."

2.01 Importance of Knowledge about 'Place'

2.02 A Knowledge System for Sustainable Development

2.03 Role for Schools

2.01 Importance of Knowledge about 'Place'

The first humans had to know their land as a survival kit. As they grew slowly into cultures by developing its natural economy, they looked upon the land not as its possessor but as a companion. To achieve this, they cultivated intimacy with their immediate environment as with a fellow human. They remembered their daily progression through a limited small world; they walked it, ate from its soils and from the animals that ate its plants. They knew its winds, they smelled its biology, observed the sequence of its flowers through the seasons, and the places where particular animals could be found. Making little impact, they were inscribed gently into their surroundings. Their lives were sustainable in that quality of life was improved while living within the carrying capacity of supporting ecosystems.

These early inscribed cultures have now become constructive cultures, changing their environment by digging and building, time and time again, out of all recognition. Constructive cultures have a way of life that ostracises the land. The consuming visions that drove them were of merchandisable timber, ploughable forest, grazable prairies, recoverable ores, damable water, netable fish. We now require education for 'sustainability' so that we may make the necessary provision for the present, without jeopardising the future for succeeding generations.

We can now only read descriptions of the worlds of the inscribed groups they displaced. The lands of inscribed communities have been totally destroyed in the name of constructive natural economy, often to increase the wealth of people who don't live there.

The first historians of pre industrial societies saw landscapes of 'native peoples' with a detached frame of mind. Their extensive first-hand knowledge was ultimately regarded as a kind of decorative information for academic study, or entertainment, only. It was taken as a series of puzzles for specialists to elucidate and isolate in university subjects. The information was never taken to be what it in fact is - a holistic, practical description of a 'home', where we may be at ease with the planetary forces which sustain us.

To be inscribed into the land is to enclose it in the same moral universe we occupy, and so include it in the meaning of the word 'community'. For constructive groups to have a sense of community they must have, at the very least, knowledge of what is inviolate about the relationship between themselves and the place they occupy. They must understand why the destruction of this relationship, or the failure to attend to it, wounds people who live and grow up there.

It is to help the next generation in this task that 'natural economy' is proposed as the most appropriate knowledge system to accommodate SCAN surveys. Being community-based, natural economy is a flexible and holistic knowledge system, oriented towards studying local environments, and the relationships between communities and their natural resources.

World leaders left the Rio Environment Summit in 1992 with the task of resolving the conflicts between economic competitiveness, social welfare, and care for the environment. Their premise was that the only true wealth that can turn exploitation into residency, and greed into harmony, comes from the cultivation and achievement of local knowledge about nations as consumers partaking of a limited global cake.

Governments have set guidelines for embracing sustainable development, which are expressed at community level in the 'Local Agenda 21' But the environmental crisis to which they are a response, is not a crisis of policy, or of law, or of administration, but one of self-education. Education for sustainable development means getting to know the local balance between living, and sustaining a relationship with the natural resources used by the community. We cannot turn to institutions, to environmental groups, or to government. We must turn to each other to discover what is locally possible, and participate in the formation of plans for a new economic order.

2.02 A Knowledge System for Sustainable Development

Environmental education is based on economic metaphors of stocks, flows and balance sheets. Human economies are nested the local 'nature bank'. From this point of view, 'human economics' is a sub-division of the 'biophysical economics' of nature. The term 'biophysical economics' is an balance sheet, accountancy, metaphor to encompass the flows of energy from Sun to Earth, and its expressions in seasons, climate, weather, and living things.

People are part of nature, and the economies of communities are the dominant factor in determining a society's interaction with the rest of nature; plants, animals, microbes, soil, rocks and weather. Increasingly, through 'industrial development', human economies typically reward ecologically destructive practices. To sustain human economic development a knowledge system is needed that deals with all the ideas we use to understand ourselves and our relations with the rest of nature. It should cross subject boundaries, and trace all linkages between economies of human production and their resources. It should draw together:

(a) physical laws (the inanimate economy)

- governing interactions between the Sun and the rotating Earth;
- governing interactions between the Earth's molten core and its surface;

(metaphorically, these two kinds of interactions may be expressed, respectively, as the 'planetary economy' and the 'solar economy');

(b) biological laws (the animate economy)

- governing the evolution of food chains and webs, which includes humans within its scope.

Flows of resources from the 'planetary', 'solar' and 'animate' economies into the technological processes of the monetary economy of a community defines its 'natural economy'. As a subject, natural economy traces the materials and energy flows in societies from resources existing in, or produced by nature, which are transformed into commodities; the surplus being brought to market, purchased, consumed and discarded. This is a single educational matrix for humanity and its uses of the rest of nature. It maps nature as a tightly integrated system bank of natural resources, and provides reasons why economic expansion cannot go on indefinitely.

In summary, natural economy deals with the *technological control* of natural resources, and its environmental impact. It is complementary to 'political economy', which deals with the social effects of *governmental control* on markets, rewards for labour, extremes of mistreatment of people, and quality of life. Although there is an international syllabus for natural economy at GCSE level (Cambridge University Local Examinations Syndicate), the subject can be assimilated into the non-mandatory guidelines of the National curriculum for environmental education. The latter is set out in Section 8.

Nature conservation is the link between natural economy and political economy. It is the biodiversity accounting and management system of communities and governments; a counterbalancing response to economic development; an effort to make markets more harmonious with the dynamics of biophysical economies. To this end, as living organisms we have to audit, protect, and manage the rest of nature upon which we depend. We have to do this in order to match markets with ecosystems which provide the natural resources for economic development, and are sources of the non-

marketable environmental goods emanating from scenic beauty, and nature study. In this context, there is a need to integrate environmental care and development under the

guiding principle of 'sustainability'. Furthermore, we need to promote the idea that biodiversity is still a vital stock in the human survival kit, and make people in all walks of life aware of its vital importance for the future of this earth.

Education about biodiversity is part of a curriculum for sustainability, and a process which is relevant to all people. Like sustainable development itself, it is a process rather than a fixed goal. It may precede- and it will always accompany- the building of relationships between individuals, groups, and their community's shared environmental resources.

All people are capable of being educators and learners in the pursuit of sustainability. Education about biodiversity should be a practical approach to sustainable development through direct local action that is also 'good earthkeeping'.

2.03 Role for Schools

The UK Government's Agenda 21 and Biodiversity Action Plans are a national response to the Rio Environment Summit. They envisage that communities should establish regular local quality of life surveys. These checks on the environment should be associated with a wider citizen's environmental network to share ideas, concerns and initiatives to help in the creation of local environmental action plans (SCANS). The problems, issues and challenges to be tackled in the Local Agenda 21 are those associated with fragile or declining features which define local character, quality of life and the roots of heritage, such as, jobs, biodiversity, transport, local services, recreation, access to the countryside, historic buildings, language, reminiscences, and family/community archives.

Local Agenda 21 requires full ongoing consultation of local politicians, and their planners, with the communities they serve. This consultation must activate as many people as possible to develop their neighbourhood action plans, and communication of these plans to either the District division of their County, or the Unitary Authority. No new money is forthcoming, but Downing Street expects its agencies and local government to do their bit and provide resources to help, initiate, and sustain a local momentum.

The nation-wide system of community monitoring and networking envisaged at Rio will have to be cheap, simple, and rely on a permanent input of local resources. In other words, any costs have to be met by local people and businesses through some kind of local 'environmental subscription' to an organisation that is permanently embedded in each community. This organisation should be equipped to undertake environmental surveillance and networking on behalf of the people, and help devise action plans to incorporate their feelings about valued local features in order to ensure stability in the rapidly changing economic framework of the neighbourhood.

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In terms of their direct links with local people, and their information handling capability, schools are an obvious social focus to air environmental concerns of the families they serve. Regular quality of life surveys, and the production of SCAN surveys by adults in partnership with children, have an educational bonus by highlighting the local environment as a 'living classroom'. Youth would become directly involved with practical applications of learning to solve the problems of their community. By making use of educational software tools for collecting and disseminating information the fixed costs of establishing a local features-database would be small. The main limiting factors would be time-out sponsorships, to allow teachers to develop a system of surveillance and communication, in collaboration with community leaders, which is compatible with their classroom objectives. The additional costs are likely to be of the order of hundreds of pounds per year per school, and well within the fund raising capability of a partnership of teachers and the local business community, organised within an appropriate unit of local government as the focal point.

This line of argument led to a project involving the Dyfed teacher's advisory service and schools in Pembrokeshire piloting simple classroom methods for pupils of all ages to probe the quality of life in their communities. The aim is to alert children to the character of their surroundings, and establish a features database that lists the good and bad things in their neighbourhood.

3.0 Education for Environmental Appraisal

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- 3.12 Focus on "Management" (the Environmental Syllabus)

3.01 Local Environmental Appraisal

Ralph Jeffrey, inspired by a book by De Wolfe written in 1964 on Italian towns, was one of the first to advocate a formal system of environmental appraisal to stimulate community participation in local planning. He advocated that this should start with local people making a 'visual enquiry' to establish the local 'spirit of the place' by posing leading questions centred on

- its spaces;
- its decoration;
- its light
- and its buildings.

However, it was not until the 1980s that attempts were made to formalise local environmental appraisal. In 1987, based on several hundred village appraisals in England, 'Action for Communities in Rural Areas (ACRE)' and 'Common Ground', launched a national promotion funded by the Countryside and Rural Development Commissions. This reached Wales in 1988 under the name 'Jigsaw', with the aim of increasing the awareness of local communities in the Principality of issues such as local housing, planning, ecology, culture and heritage. 'Jigsaw' was based on a local questionnaire designed to make a 'community appraisal', and a 'local map'. The appraisal is a stock-taking of a village, town, or community; its people, its services, facilities, and environment, how it has changed, what is important, what needs improving, and what is lacking. The map is a representation of local feeling about a place, its culture, history, and environment; in other words, its distinctive character seen through the eyes of local people. It can be a map in the conventional sense, but there are many other imaginative ways of presenting what is really a community knowledge design. Furthermore, this knowledge design does not have to be assembled all at once. It makes organisation sense and often meets the financial realities to take up each major element of the environment in separate thematic

campaigns; i.e. this year might concentrate on 'infrastructure', next year on 'trees', and the year after on 'water' or 'local history'. This emphasises an essential requirement of continuity. Appraisals are hardly ever embedded in the community and once the survey has been completed, the energies evaporate, and the report ticked off and put on the shelf.

The value of a Jigsaw campaign is to produce a corporate identity to the community. This means bringing important elements of the community to a common point of focus, which of necessity will involve the delivery of the necessary education, and training to produce a corporate identity.

3.02 Factors Limiting Environmental Appraisal

The three main factors limiting the involvement of communities in environmental appraisal, and which require funding a permanent organisation within the community, are:-

- the difficulty of making and sustaining links that have to be established between a relatively small voluntary body, and the permanent organisations providing help, contacts, resources and detailed information;
- the lack of knowledge and confidence in establishing procedures for local volunteers to participate and act in environmental appraisal schemes;
- the need for data handling systems associated with a permanent community 'office' (to serve the requirements for typing, filing, and telecommunications), to elicit, manage and monitor actions arising from the appraisal.
- the difficulty of carrying out regular repeat surveys and making and sustaining external links;
- who represents 'the community'? Even the smallest village will have at least two adult groupings with legitimate claims.

The original booklet to back the local Welsh Jigsaw campaign, from which a community gets its guidelines to set up a village appraisal, presented the volunteers with an awesome list of the expert skills and contacts they will probably need.

To make their appraisal it says they will require the help of professionals and experts such as photographers, clergy, doctors, health visitors, designers, local historians, the local school and its children, and policy and planning officers.

To fund their activities they have to persuade the local community council to raise a special rate. They have to make sponsorship requests to local businesses, government agencies and trusts for grants to maintain their initiative and carry out their action plans for years to come. Although the County Voluntary Council was indicated as the community's "first point of contact which allows you to plug into the system", the 'Jigsaw' guide listed 14 regional and national contacts as sources of help, from the "Countryside Commission" to "UK 2000".

A particular problem here is that Jigsaw is not the only initiative aimed at linking communities and environment in Wales. At that time, local environmental improvement grants were provided independently by UK 2000 Cymru, and the Prince of Wales' Committee. UK 2000 Wales also gave grants and provided support training, and was a focus for all voluntary environmental groups in Wales. In South Wales, Gwent Community Design operated a questionnaire system, with follow up workshops, and the Welsh Natural Economy Research Unit in the National Museum of Wales supported the establishment of community action groups based on a computer loan scheme, and helped with follow-up sponsorships, to buy a computer 'office' for the community.

This brief account of the complex world of local environmental action indicates the importance of establishing a firm physical/secretarial base for the community operations which may be described as a community office.

3.03 Lack of Knowledge

A common theme of discussion throughout the history of environmental appraisal has been a failure of our schools to educate children to participate in local planning and the community politics that drive it. Young people emerge from school unaware of the imperatives governing their local environment and the possibility of changing them; most, therefore, although familiar with global environmental issues, have no confidence in their own ability to make local environmental improvements for the benefit of themselves or others.

Colin and Mog Ball in the mid 70s were the first to champion a community approach to environmental education. They put it this way "Whatever we call home, comely cottage or high-rise flat, we live these days in a built environment. Yet although the fields, streets, buildings where we live and work, and even the very air we breathe, are all made by PEOPLE, they have an iron grip on OUR actions. They are the imperatives which define the scope of our lives. Maybe we are just kidding ourselves when we say that we make and shape our environment: for most of us it is the environment which shapes us. This results in the paradox that, as adults, we are controlled, dominated and harassed by the very environment people have created".

Accordingly, the community design is "concerned with highlighting the imperatives which limit our lives and the lives of other people, within the small community round about. It is a programme TO ENCOURAGE INDIVIDUALS TO DESIGN THEIR OWN KNOWLEDGE SYSTEM that delineates the places people have made, and the way they and others respond to them".

A community design metaphor, i.e. 'jigsaw', 'mosaic' 'community map', or 'learning frame', is a conceptual knowledge system produced by the members of the community. It is based on the gathering of local data and information. This is then structured to provide knowledge to encourage 'helping-relationships' between people. In particular, it enables young people, growing up into an adult-made world, to see that it is necessary and possible to change that world. The design starts from the appearance of a local need for environmental knowledge or know-how to back action for improvements. It is rooted in the community. The aim is to create a

depth of understanding and awareness of their community in individuals, essentially on a personal (and probably emotional) level. This should broaden personal understanding of environmental concerns and encourage altruism.

It is in the above context the 'Schools in Communities Agenda 21 Network' emerged. It rapidly developed in the fertile no-mans land of education for community participation as a 'curriculum friendly' procedure to make community designs, and create local management plans to soften the environmental impact of local economic development.

3.04 A Schools in Communities Network

SCAN was invented in 1995, within the Dyfed teacher's advisory service, to help schools carry out neighbourhood quality of life surveys and biological monitoring. It germinated from a working part set up jointly by the Dyfed County Council's educationalists, and the Countryside Council for Wales, to develop, test and launch an interactive environmental road show, named DAEARTH (Earth Watch). DAEARTH was created in the Dyfed teacher's resource centre at St Clears, with the objective of providing resources and training for Dyfed's schools, and encouraging them to take up the environmental curriculum recommended, but seldom implemented, by the National Curriculum guidelines. SCAN emerged from the methodologies of the Welsh community appraisal campaign (Jigso), and Dyfed County Council's long-standing commitment to stimulate and support cross-curricular work in local schools. A recent St Clears production at the time was 'The Haven', a cross curricular teaching pack about 'place', for the National Curriculum years 1 to 9, which set out educational advantages of concentrating on the school's local patch.

The actual starter stimulus was the children's Agenda 21, published in 1994 by Peace Child International (Rescue Mission Planet Earth). The youth group that produced Rescue Mission made several suggestions as the way children could open communication channels with local politicians and planners. 'SCAN' (originally entitled 'Linking Through Landscapes') is a practical way forward.

The aim of SCAN is to encourage children to produce local environmental management plans to help their communities develop the local Agenda 21. These plans quantify local problems, define what should be done, identify what the school should do, and say what others, in and around the community should do.

3.05 SCAN in outline

The main objective is to help schools define a local picture by:-

- finding environmental problems, issues and challenges - (e.g. crime, homelessness, transport, health, wildlife, recreation);
- measuring them;
- doing something about them.

A wider view may then be developed by:-

- finding out what the local authority is doing to help its environment;
- telling the Council what the school is doing to help;
- discovering how things used to be in the community;
- seeing the total picture across the curriculum;

SCAN is complementary to other national educational initiatives currently being promoted in the arena of sustainable development, and local environmental education; such as 'Rescue Mission Planet Earth', 'Eco-Schools', and Learning Through Landscapes". It has been enthusiastically received by local authorities, schools advisors, examiners, teachers, students, environmental agencies and business.

SCAN is unique in its objectives to:

- involve schools in the workings of local government;
- create a depth of understanding and awareness of how their community is governed;
- develop a national network of councils to share ideas about how to involve schools in the Local Agenda 21.

SCAN:-

- builds upon the work of two national campaigns 'Jigso' (Wales) and 'Enviroscope' (England), which promote environmental awareness at community/family level;
 - is driven by teachers who have developed successful classroom exemplars;
 - is supported by their advisors and local authorities;
 - harnesses the national curriculum to the workings of local government and its plans for sustainable development emanating from the Rio environment summit;
 - provides a stimulus for teachers to use the local environment and its problems and issues, as a challenging educational resources;
 - makes what schools already do within the National Curriculum more meaningful and, although not prescriptive, provides a standard IT structure for schools to communicate their work, plans and feelings about the future of their community to local government;
 - models best practice in environmental management to help schools make and operate action plans for local improvements in the context of the Local Agenda 21.
-
- enables people to understand the interdependence of all life on this planet and the repercussions that their actions and decisions may have both now and in the future on biological resources, globally and locally;
 - increases people's awareness of the economic, political, social, cultural, technological and environmental forces which foster or destroy biodiversity;

- develops peoples awareness, competence, attitudes, and values, enabling them to be effectively involved in sustainable development at local national, and international levels;
- helps people to work towards a more equitable and sustainable future, particularly it through the integration of environmental and economic decision making.

3.06 Current Work Programme

The current work programme involves:-

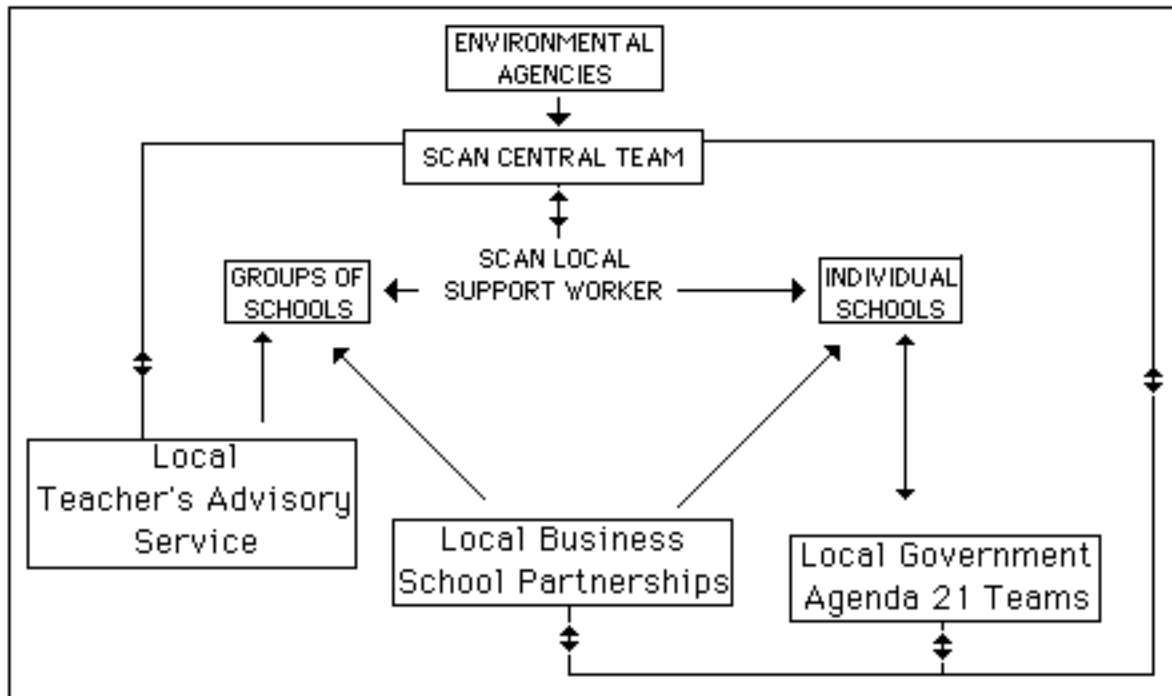
- encouraging teachers to produce key stage exemplar packs;
- carrying out information/training visits to schools, and groups of schools, to develop and bolster a county-wide network with their supporters;
- training local evangelists, either in individual schools, or as part of the local teacher-supply service, to maintain and spread SCAN membership within the authority;
- working with local authorities to produce educational materials and information routes that encourage schools to interact with local government as a learning experience.

Each school is networked by :-

- providing an information pack on standard methods, compatible with national curriculum objectives, for reporting on the local quality of urban and rural life in the spirit of Rio;
- demonstrating how to derive local environmental management plans from the data;
- defining routes to channel their concerns to their local authority;
- helping the implementation of projects for environmental/social improvements;
- establishing a central database of survey data, management plans, achievements, and information on the local Agenda 21, and Biodiversity action plans open to all schools and their local authorities;
- training local support workers who will respond to requests from schools to develop and maintain the county/ district network;
- registering the schools in a national/European network, and collect nominal membership fees;
- spreading best practice between schools in 'management education' at the community/local government interface.

In summary SCAN makes what teachers already do for the national curriculum more interesting to pupils, more relevant to local problems, and more challenging in that it prompts youth to management in the real world. In this way it is possible for a school to realise the idea of a 'citizens environmental network' by rooting an environmental information system within the community, and working through the Schools In Communities Agenda 21 Network to spread the ripples.

The SCAN Network (Fig 3.01)



3.07 Links Between Curriculum and Citizenship

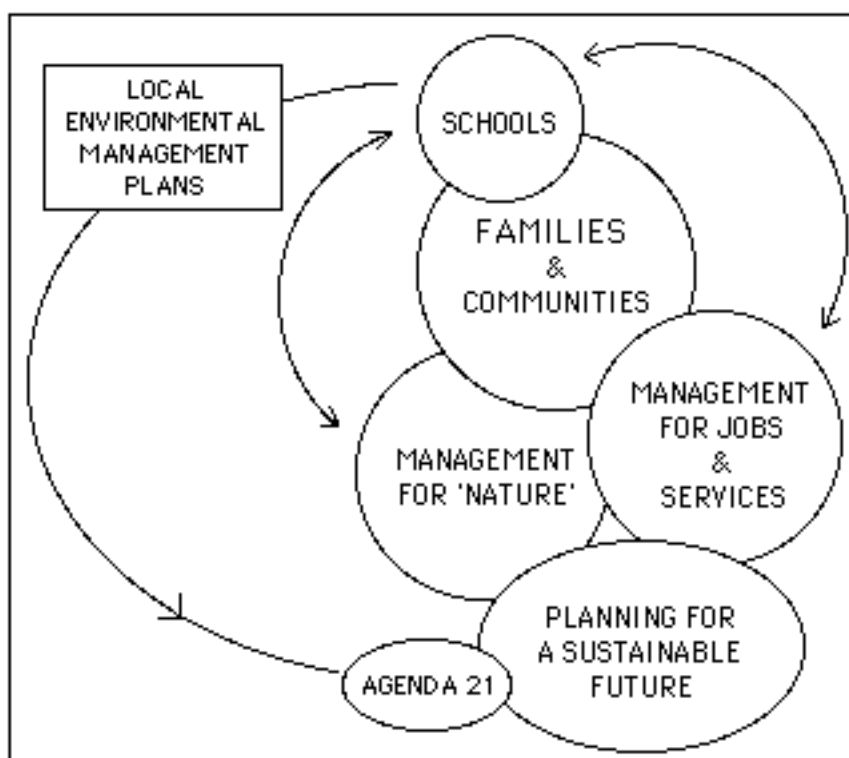
SCAN protocols encourage the study of the environmental ethos and operations of countryside management as a constantly developing holistic interplay between environment and local economic planning. This knowledge system is set apart from schools. On the one hand it resides in the science and practice of nature conservation, and, on the other, it is locked into the local planning department, and the policies of the elected representatives. SCAN fills this gap by providing a teacher training package, and classroom resources, which focus on the duties and grass roots tasks of site managers, and planners, and their connections with local government and the communities they serve. Here, SCAN encourages attitudes and qualities necessary for everyone growing up in a world dominated by concerns about the environment, and who eventually, as voting citizens, will have to take a stand on the local and national problems, issues, and challenges of world development.

Schools who are members of SCAN are finding ways to delineate curriculum objectives which bear on the Government's plans for sustainable development. A start can be made with the school community by asking which of its activities are unsustainable. This may be followed by surveys of community life, business, local services, and the biodiversity of parks and gardens.

Understanding the problems arising from economic policy requires participation in the local planning process. The Local Agenda 21 is about balancing management of the environment to support jobs and on the one hand, and to preserve community services

and enhance local biodiversity, on the other. A school taking part in Community SCAN enters this planning arena, interacting with families and communities which depend on the planning process to maintain jobs and services in equilibrium with nature (Fig 3.02).

Fig 3.02 Schools in the Agenda 21 'planning arena': checking out management of the local quality of life.



Environmental management plans saying what the school can do, and what others should do, are the civic outcome of this interaction. These can be passed on to local government, business and the environmental agencies.

A succession of pupils taking up the same approach from year to year ensures that a local checking and monitoring system remains in place. The year to year progression also provides an interactive environment for learning how local government works, and how citizens can participate.

3.08 Systems Thinking and I.T.

Computers are tools which allow us to overcome our inherent limitations to storing and articulating large amounts of information, and thinking about how to manage systems. Schools software is available for carrying out environmental surveys. Results can be communicated in a variety of IT formats. SCAN brings IT to bear across the curriculum to deal with real information of local importance. Further, local data can be shared with others, and added to a national database, for comparisons to be made with other communities.

The importance of computers in providing explanations and predictions about dynamic phenomena makes them of fundamental importance to teach people about environmental management. Learners have two basic approaches, they can either use explanations provided by others, or seek to develop explanations for themselves. The former produces some level of understanding quickly. The latter has the potential for producing a deeper and more lasting understanding by 'ownership of knowledge' through 'discovery'. Preparing a management plan to deal with school litter, or sustain a patch of wild flowers, are, again, real applications of IT, which give ownership of knowledge and require thinking about the system of resources of which the plan is only one component. A computer database makes it easier to trace dynamic behaviour patterns of the whole system, and predict effects of management on its future condition. By encouraging the creation of school environmental management plans SCAN promotes systems thinking. Finally, computers can make cross-curricular learning resources about environmental management easier to use if packaged as self-indexing files (electronic books and documents). SCAN provides backup of this type.

3.09 The Educational Experience

The core of the famous carnival in Rio de Janeiro is a twelve-hour-long procession of song, dance and street theatre. One troop of players after another presents its piece. Usually, the piece is a social comment dramatised through music and dance. The processions are not spontaneous. Preparing them as well as performing in them are important parts of Brazilian life. Every group prepares separately- and competitively- in its own learning environment, which is called a 'samba school'. These are not schools as we know them: they are social clubs with memberships that may range from a few to many hundreds. Each club owns a building, a place for dancing and getting together. Members of a samba school go there most weekend evenings to dance, to drink, to meet their friends. As they dance everyone is learning and teaching as well as dancing. Even the stars are there to learn their difficult parts. There is a great sense of social cohesion, a sense of belonging to a group, which is part of a community of groups, and a sense of common purpose.

The samba school* represents a set of attributes that every learning environment should, and could, have. Learning is not separate from reality. The dance samba has a social purpose and learning is integrated into the school for this purpose. Novice is not separated from expert, and the experts are also learning.

SCAN is also a 'school' for learning with a purpose. By producing a small environmental management plan a class can see what is involved in planning to put things right.

Tasks can be separated into those that can be tackled by pupils and those that are the responsibility of others. Year to year monitoring provides a check that things get done. It is an educational innovation that is sensitive to what is happening in the surrounding culture; the flow of ideas from community to school is not a one-way street, and there are opportunities for youth to get together with others engaged in similar activities.

Knowledge being learned by questioning the local environment is continuous with world culture. There is a lot to talk about and there are important things young people can do. In a democratic society everyone has the right to have views, and make them known. Our elected leaders need to know our opinions if they are to act on our behalf. Such activities are likely to be most effective if our opinions are well informed, and channelled through the Local Agenda 21. Politicians are also accountable to us, and we can check up on their actions, which should emerge as action plans for sustainable development and biodiversity in the Local Agenda 21.

* The samba school was chosen as an educational metaphor by Seymour Papert to promote educational methods that do not need continuous support once they take root in an actively growing mind.

3.10 'SCAN' Links To The National Curriculum

SCAN has a bearing on all subjects, but is particularly important in presenting the local environment as an educational resource for geography, biology and cross-curricular environmental education.

3.11 Focus on "Place" (Geography and Biology)

The SCAN methods of enquiry meet most of the study requirements of geography at all levels. The links develop from first two Key Stages where SCAN meets most of the curriculum targets. These requirements are aimed at giving pupils opportunities to express their own views about places and environments. Additionally, the SCAN theme of 'sustaining local biodiversity' can link geography and science through objectives which require studying the ways in the local environment is managed to protect living things.

For each place, and its features, the curriculum states that the enquiries should be based on pupils asking What is it?: Where is it?: What is it like?: How did it get like this?. SCAN focuses the answers on the local Agenda 21 as a route to get action about things that concern them.

The geography syllabus says pupils should develop their knowledge, by describing and comparing their own locality, and its features, with two other places, one of which should be an economically developing country. Two schools communicating the results of SCAN surveys on quality of life and biodiversity can generate a structured dialogue about sustainable development.

SCAN surveys satisfy the syllabus requirements that pupils should:-

- collect and record information;
- communicate information and ideas;
- identify and name physical and human features of the locality;
- recognise the features that give the places their character;
- express views on the attractive and unattractive features of the locality;
- investigate how land and buildings are used;

- identify similarities and differences between localities by studying landscape, weather, transport, jobs;
- identify differences between local environments that affect which animals and plants are found there. These differences, which influence local biodiversity, can be studied by:-
 - describing and grouping rocks and soils on the basis of their characteristics;
 - understanding the water cycle, and the part played by evaporation and condensation;
 - assigning locally occurring animals and plants to groups using keys,
 - discovering how animals and plants in two different habitats are suited to their environment, and recognise that the idea of evolution provides an explanation.

From these general enquiries, SCAN supports more detailed study of one of the following three statutory themes, each of which is central to understanding sustainable development and biodiversity.

Weather- Pupils should observe, describe and record a range of weather conditions of the local area and investigate the effects of weather on themselves and their surroundings.

Jobs- Pupils should identify some of the jobs done by adults who provide goods and services for the community, and investigate why people make journeys, and where people in the community go to obtain goods and services

Quality of environment- Pupils should express views on the attractive and unattractive features of the environment and investigate activities which have changed the environment and consider ways in which they can improve their environment.

The curriculum recommends comparative enquiries between schools so that pupils become aware of places beyond their own local area. In particular, SCAN's investigative work could develop to compare:

- climatic conditions in other parts of the world;
- issues that show how conflicts can arise over the use of land and that different people have different views;
- how people look after and manage the environment to protect living things.

3.12 Focus on "Management" (the Environmental Syllabus)

SCAN's philosophy is that environmental education is more about facing up to cross-curricular issues of economic development and consumerism, than gaining detailed knowledge in core subjects about how the environment works. It is a practical expression of the UK non-statutory guidance on environmental education, and highlights eight out of the ten areas recommended to develop knowledge with understanding. These areas deal with human impact, the need for environmental legislation, planning and local environmental management.

In stressing the importance of teaching about environmental management, SCAN falls in with government guidelines to create an environmental curriculum. In particular, it encourages teachers to develop knowledge and understanding in the following areas where management impinges on families and communities :-

- local, national and international legislative controls;
- how policies and decisions are made about the environment;
- the environmental inter-dependence of individuals groups, communities and nations.
- how human lives and livelihoods are dependent on the environment;
- the conflicts which can arise about environmental issues;
- how the environment has been affected by past management;
- the importance of planning, design and aesthetic considerations;
- the importance of effective management to protect and manage the environment;
- the impact of human activities on the environment;
- different environments, both past and present.

SCAN follows government guidelines by encouraging pupils to express the following attitudes and personal qualities which are important in taking a personal view on environmental issues:

- appreciation of, and care and concern for, the environment and other living things;
- independence of thought on environmental issues;
- a respect for the beliefs and opinions of others;
- a respect for evidence and rational argument;
- tolerance and open-mindedness.

Regarding topic teaching, SCAN stimulates and supports environmental enquiry within all curriculum topics recommended to develop basic knowledge and understanding of the environment, and which are directly related to local issues of economic development.

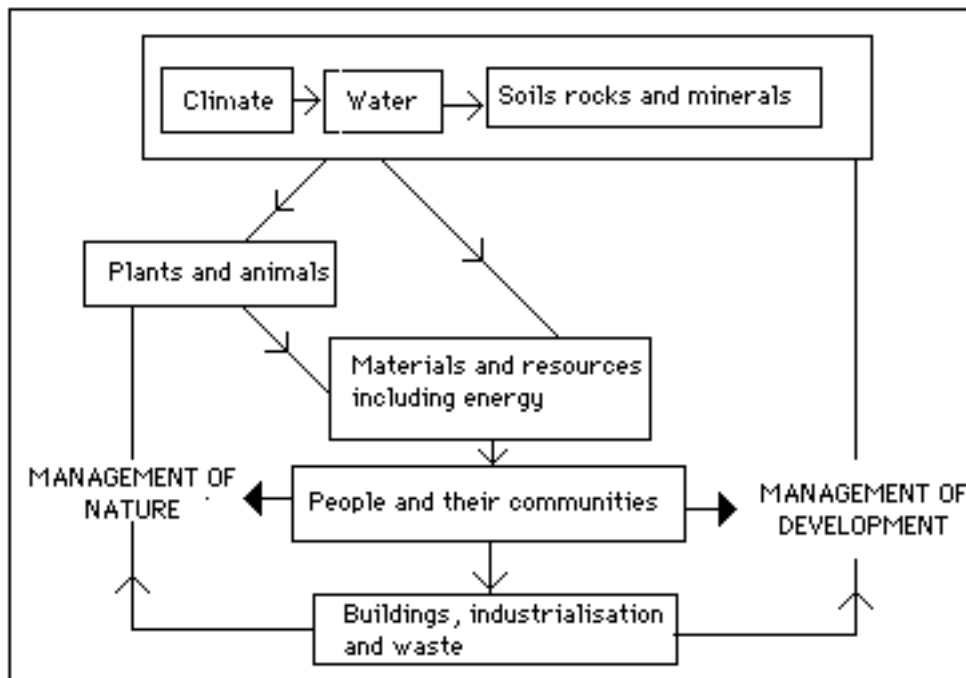
These topics are:-

- people and their communities;
- materials and resources including energy;
- buildings, industrialisation and waste;
- water;
- plants and animals;

- soils rocks and minerals;
- climate.

By focusing on the local Agenda 21, SCAN links these topics to form a web for a cross-curricular environmental curriculum exemplified in the local natural economy. This structure defines the flows of natural resources into developing communities, and the adverse impact of unchecked development on the availability of these resources. The knowledge navigation system (Fig 3.03) recognises that local educators have a dual responsibility to integrate environmental and economic aims.

Fig 3.03 SCAN knowledge navigation system for an environmental education curriculum centred on integration of economic and environmental aims of management to protect materials and resources.



In relation to this scheme, SCAN encourages direct involvement with local management of 'development' and 'nature', to conserve and improve landscape and habitats, to protection land and sea from destructive developments, and to reduce the impact of consumerism on the global climate.

At a practical level SCAN is a vehicle to implement long-standing national curriculum recommendations that the neighbourhood should used as a resource for the development of skills through direct experience, enquiry and investigation

SCAN's practical methods encourage values, attitudes and positive management concerned with:-

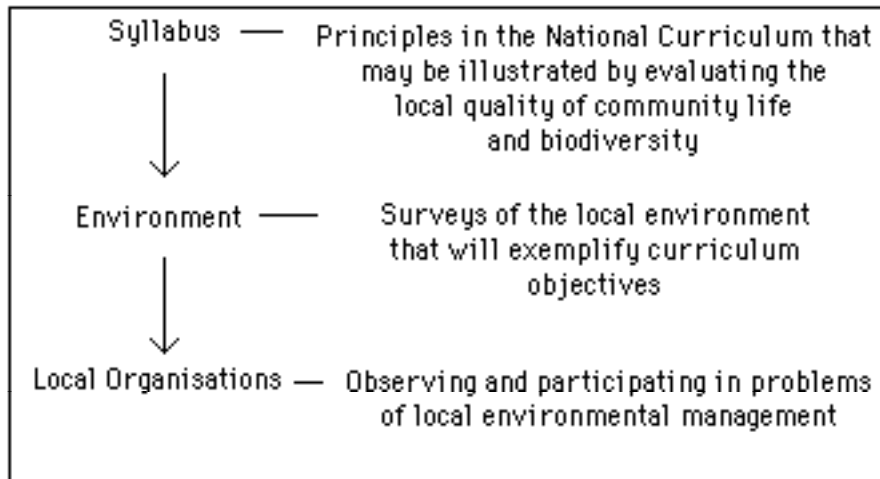
- finding ways of ensuring caring use of the environment, now and in the future;
- finding solutions to environmental problems, taking into account the fact that there are conflicting interests and different cultural perspectives;
- informing the choices which have to be made.

SCAN's emphasis on the production and operation of local environmental management plans is a unifying practical thread to follow curriculum guidelines for environmental education. The school's Agenda 21 methods for backing action provide routes from classroom to environmental management, which have been mapped successfully by teachers. These methods can lead to concerted management to tackle the problems, issues and challenges of local development, and improve the local quality of life. School-produced environmental management plans, demonstrate the problems, state what should be done, 'projectise' what the school can manage, and tell the local elected representatives, and their Agenda 21 planners, what they should do. Repeat surveys incorporated into a school's long-term teaching plan check things get done.

Teachers who are already participating in Community SCAN have delineated routes from principles of subjects within the syllabus to their expression in the neighbourhood. The use of the environment as a curriculum resource may be directed to study the environmental relationships of local organisations, such as businesses and conservation bodies, as examples of environmental management in action (Fig 3.04). Here the professional model is the UK Countryside Management System (CMS), which is widely used by government agencies and voluntary organisations for managing nature sites.

Guidance in the form of a 'school CMS', is available for the production of plans to manage school projects such as litter clearance, or establishing a small playground nature site. This management action planner (MAP) is a simple relational database for setting out the objectives, routes to the objectives and the work that has to be done, in a systematic way.

Fig 3.04 From 'syllabus' to 'environmental management'



4.0 PRINCIPLES OF SUSTAINABLE DEVELOPMENT

4.01 Resources, Pollution, and Environmental Degradation

4.02 Matter and Energy

4.03 Ecology

4.04 Economics

4.05 Politics

4.06 World view and Ethics

4.01 Resources, Pollution, and Environmental Degradation

Resources are limited and must not be wasted; there is not always more (principle of limits). Most wastes and pollution are either resources we are too dumb to use or are so dangerous they shouldn't have been produced (no-waste-in-nature principle). To reduce pollution and resource use and waste, recycle or reuse mineral resources (principle of recycling and reuse). Recycling mineral resources takes energy, which in being produced and used causes pollution and environmental degradation (recycling-is-not-the-ultimate-answer principle). To reduce resource waste and resource supply interruptions, get as much as possible of what we need locally, and dispose of or recycle wastes locally (principle of localism). To reduce pollution and resource use and waste, use resources primarily to meet vital needs and use these resources as efficiently as possible (principle of moderation). Stress the use of perpetual and renewable resources, and use renewable resources no faster than they're replenished by natural processes (principle of sustainable yield). Try to get resources from many sources; don't put all your eggs in one basket (principle of resource diversity) . Everyone is downwind or downstream from everybody (principle of the global commons).

4.02 Matter and Energy

- We cannot create or destroy matter; we can only change it from one form to another. Everything we think we have thrown away is still here with us in one form or another; there is no away (law of conservation of matter).
- Organised and concentrated matter is high-quality matter that can usually be extracted, processed, and converted into useful resources at an affordable cost; disorganised and dispersed matter is low-quality matter that often costs too much to convert to a useful resource (principle of matter quality).
- Don't dilute, disperse, or mix matter products or wastes that can be recycled (principle of affordable recycling).
- We cannot create or destroy energy; we can only change it from one form to another. We can't get energy for nothing; it takes energy to get energy (first law of energy, or law of conservation of energy).
- Organised or concentrated energy is high-quality energy that can be used to do things; disorganised or dilute energy is low-quality energy that is not very useful (principle of energy quality).

- In any conversion of energy from one form to another, high-quality, useful energy is always degraded to lower-quality, less useful energy that can't be recycled to give high-quality energy; we can't break even in terms of energy quality (second law of energy, or law of energy-quality degradation).
- Everything runs on moderate- to high-quality energy that can't be recycled, so choose and use energy resources wisely (principle of energy use and flow). Don't use high-quality energy to do something that can be done with lower-quality energy; don't use a chain saw to cut butter or electricity to heat a house or household water (principle of matching energy quality to energy tasks).

4.03 Ecology

- In nature we can never do just one thing; everything we do creates effects that are often unpredictable (first law of ecology, or principle of ecological backlash.)
- Everything is connected to and intermingled with everything else; we are all in it together (second law of ecology, or principle of inter relatedness).
- Any chemical that we produce should not interfere with any of the earth's natural biogeochemical cycles in ways that degrade the earth's life support systems (third law of ecology, or principle of chemical non-interference).
- The earth's life-support systems can take a lot of stress and abuse, but there are limits (law of limits).
- Each species and each individual organism can tolerate only a certain range of environmental conditions (range-of-tolerance principle).
- No population can keep growing indefinitely (principle of carrying capacity).
- Nature is not only more complex than we think but more complex than we can ever think (principle of complexity).

4.04 Economics

- The market price of anything should include all present and future costs of any pollution, environmental degradation, or other harmful effects passed on to society and the environment (principle of internalising all external costs).
- Try to get more output of goods and services from less resource input; do more with less (principle of increasing efficiency and productivity).
- Some forms of economic growth are harmful; don't produce harmful goods (principle of economic cancer).
- Don't waste resources trying to produce harmful goods more efficiently (principle of wasteful efficiency).
- Short-term greed leads to long-term economic and environmental grief; don't deplete capital and mortgage the future (no-free-lunch principle).
- The more things you own, the more you are owned by things (principle of over consumption and 'thing' tyranny).
- Don't give people subsidies and tax breaks to produce harmful goods and unnecessarily waste resources; either eliminate all resource subsidies or reward only producers who reduce resource waste, pollution, and environmental degradation (principle of economic and ecological wisdom).
- We cannot have a healthy economy in a sick environment (economics-as-if-the-earth-mattered principle).

4.05 Politics

- Human population growth ultimately makes democracy and individualism impossible (principle of freedom erosion).
- Anticipating and preventing problems is cheaper and more effective than reacting to and trying to cure them; an ounce of prevention is worth a pound of cure (prevention, or input control principle).
- Every crisis is an opportunity for change (bad-news can-be-good-news principle).
- Think globally, act locally (principle of change).
- Don't ever call yourself a conservative unless what you want to conserve is the earth (principle of true conservatism).

4.06 World view and Ethics

- We are part of nature (principle of oneness).
- We are a valuable species, but we are not superior to other species; all living beings, human and non human, have the same inherent worth (principle of humility).
- Every living thing has a right to live, or at least struggle to live, simply because it exists; this right is not dependent on its actual or potential use to us (respect-for-nature principle).
- Our role is to understand and work with the rest of nature, not conquer it (principle of co-operation).
- The best things in life aren't things (principle of love, caring, and joy).
- Something is right when it tends to maintain the earth's life-support systems for us and other species and wrong when it tends otherwise; the bottom line is that the earth is the bottom line (principle of sustainability and ecocentrism).
- It is wrong for humans to cause the premature extinction of any wild species and the elimination and degradation of their habitats (preservation of wildlife and biodiversity principle).
- We have a right to protect ourselves against harmful and dangerous organisms, but only when we cannot avoid being exposed to such organisms or safely escape from the situation; in protecting ourselves we should do the least possible harm to such organisms (principle of self-defence).
- We have a right to kill other organisms to provide enough food for our survival and good health and to meet other basic survival and health needs, but we do not have such rights to meet non basic or frivolous wants (principle of survival).
- When we alter nature to meet what we consider to be basic or non basic needs, we should choose the method that does the least possible harm to other living things; in minimising harm it is in general worse to harm a species than an individual organism, and still worse to harm a biotic community (principle of minimum wrong).
- It is wrong to treat people and other living things primarily as factors of production, whose value is expressed only in economic terms (economics-is-not everything principle).
- We must leave the earth in as good a shape as we found it, if not better (rights-of-the-unborn principle).
- All people must be held responsible for their own pollution and environmental degradation (responsibility-of-the-born principle).

- No individual, corporation, or nation has a right to an ever-increasing share of the earth's finite resources; don't let need slide into greed (principle of enoughness).
- We must protect the earth's remaining wild ecosystems from our activities, rehabilitate or restore ecosystems we have degraded, use ecosystems only on a sustainable basis, and allow many of the ecosystems we have occupied and abused to return to a wild state (principle of ecosystem protection and healing).
- In protecting and sustaining nature, go further than the law requires (ethics-often-exceeds-legality principle).
- To prevent excessive deaths of people and other species, people must prevent excessive births (birth control-is-better-than-death-control principle).
- Everything we are and have or will have ultimately comes from the sun and the earth; the earth can get along without us, but we can't get along without the earth; an exhausted earth is an exhausted economy (respect-your-roots or earth-first principle).
- Don't do anything that depletes the earth's physical, chemical, and biological capital that supports all life and human economic activities; the earth deficit is the ultimate deficit (balanced-earth budget principle).
- Love thy species and other species today and in the future as thyself (principle of species love and protection).
- To love, cherish, and understand the earth and yourself, take time to experience and sense the air, water, soil, plants, animals, bacteria, and other parts of the earth directly; learning about the earth indirectly from books, TV images, and ideas is not enough (direct-experience-is-the-best-teacher principle).
- Learn about and love your local environment and live gently within that place; walk lightly on the earth (love-your-neighbourhood principle).

5.0 A CHILDREN'S AGENDA 21

This is an abstract of a children's version of Agenda 21. The original was produced as an illustrated book, written in English by representatives of nearly 100 countries, and published on International Earth Day 1994. The objective was to stimulate the formation of a global youth network to produce a better understanding of the fragile world in which we live. The hope in making it was that members of this network would dedicate themselves to do everything possible to protect and enhance our planet. So far, the book has not made a great impact, so this summary was produced to draw attention to its existence and highlight the main recommendations of Agenda 21, and points for action, as seen through the eyes of children. These could be the starting points for schools to help the communities they serve with their plans for sustainable development.

- 5.01 Introduction
- 5.02 The road to Rio
- 5.03 Children at Rio
- 5.04 What the politicians said
- 5.05 Important Agenda Items
- 5.06 Important Action Points
- 5.07 How should we act?
- 5.08 Children's Councils
- 5.09 Get Connected!
- 5.10 Target Dates
- 5.11 The Welsh Response
- 5.12 SCAN's Aim and Objectives
- 5.13 The Approach

5.01 Introduction

The Earth Summit, held in June 1992 in Rio de Janeiro, was the largest meeting of world leaders ever. Together, these leaders created a document called AGENDA 21, a blueprint for saving Planet Earth.

Now thousands of kids from nearly 100 countries have worked together in an extraordinary effort to find out exactly what was agreed in this important document. This unique book was designed, written and produced **by children for children** to inspire young people all over the world to join the rescue mission to save our planet, our only home. The Children's Agenda task force was co-ordinated by Peace Child International, a non-profit making educational charity and was sponsored by UNICEF UNDP UNEP AND UNESCO.

The children's version of Agenda 21 was published on International Earth Day 1994 by Kingfisher Books ISBN 1-85697-175-9. US Library of Congress Card 94-2088. This summary was produced by Welsh children in the National Museum of Wales to spread the message on International Earth Day 1995)

5.02 The road to Rio

The Rio Summit was the product of global environmental worries which began in 1972. That's when 70 governments met in Stockholm for a conference which created the United Nations Environment Programme or UNEP. UNEP's main job was pushing governments to take more care of the environment. It also hooked up with UNESCO to push environmental education. In 1984, it helped to publish the World Conservation Strategy-a forerunner to Agenda 21. It didn't go into the question of development- the need to balance protecting the environment with people's need for food. So the United Nations appointed a world commission on environment and development, which produced the famous report called "Our Common Future", which set out the idea of sustainable development. This means: *Meeting the needs of the present without compromising the ability of future generations to meet their needs.* Get it?- feed the world today but leave a planet around for your great grandchildren.

In 1989, the UN decided to hold a conference on environment and development. Brazil offered to host it in Rio. For 2 years, governments, NGOs and experts thrashed out a document that 179 states could agree to. Agenda 21 was the result! Its not a fixed law: no one's going to be punished if they don't do what it says. But the fact that all those governments did agree to it make it very important.

5.03 Children at Rio

Coming here today, I have no hidden agenda. I am fighting for my future... At school, you teach us to behave in the world. You teach us not to fight with others, to work things out, to respect others, to clean up our mess, not to hurt other creatures, to share and not be greedy. Then why do you go out and do those things you teach us not to do?

Severn Cullis-Suzuki, 12, delegate to the Rio Earth Summit

5.04 What the politicians said

The greatest challenge of both our time and the next century is to save the planet from destruction. It will require changing the very foundations of modern civilisation- the relationship of humans and nature

Mikhail Gorbachev

As Chairman of the Space Subcommittee in the Senate, I strongly urged the establishment of a Mission to Planet Earth, a world-wide monitoring system staffed by children... designed to rescue the global environment.

Albert Gore Jnr

5.05 Important Agenda Items

The following statements summarise the message of specific chapters of agenda 21 which the action group thought were particularly important for immediate action

AGRICULTURAL PRODUCTIVITY

The priority must be to maintain and improve the capacity of agricultural lands to support an expanding population: [Agenda 21 Chapter 14](#)

ALTERNATIVE ENERGY

Governments must get greater energy efficiency out of existing power stations, and develop new, renewable energy sources such as solar, wind, hydro, ocean and human power: [Agenda 21 Chapter 9](#)

ANTI-POVERTY PROGRAMMES

The main aim of anti-poverty programmes is to make poor people better able to earn a living in a sustainable way: [Agenda 21 Chapter 3](#)

BIODIVERSITY

Biological resources feed and clothe us, provide us with housing, medicines and nourishment. The loss of biodiversity continues at a faster rate as a result of human activity: [Agenda 21 Chapter 15](#)

CITIES

A growing number of cities are showing symptoms of the global environment and development crisis, ranging from air pollution to homeless street dwellers: [Agenda 21 Chapter 7](#)

DESERTIFICATION

The results of drought and desertification include poverty and starvation. About three million people died in the mid-1980s because of drought in Africa south of the Sahara.

FOREST DESTRUCTION

Forests world-wide are now threatened by uncontrolled exploitation by human beings. They are being turned into farms or destroyed for timber and other uses: [Agenda 21 Chapter 11](#)

FORESTS AND CULTURE

Forests need to be preserved for their social and spiritual values, including the traditional habitats of indigenous people, forest dwellers and local communities: [Agenda 21 Chapter 11](#)

FRESHWATER RESOURCES

All social and economic activity relies heavily on fresh water. Water is becoming scarce in many countries. The management of water resources is of paramount importance in the 1990s and beyond: [Agenda 21 Chapter 18](#)

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HEALTH

Human health depends on a healthy environment, clean water supply, sanitary waste disposal, adequate shelter and a good supply of healthy food: [Agenda 21 Chapter 6](#)

HEALTH AND ECONOMIC DEVELOPMENT

Sound development is not possible without a healthy population, but the lack of development makes many health problems far worse. The overall goal is "Health for All by the Year 2000": [Agenda 21 Chapter 6](#)

HOMELESS PEOPLE

Governments should see that the homeless get access to land, credit, and low-cost building materials: [Agenda 21 Chapter 7](#)

HUMAN CONSUMPTION

The major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in the industrialised countries: [Agenda 21 Chapter 4](#)

HUMAN POPULATION: CARRYING CAPACITY

Countries need to know their national population carrying capacity- how many people their countries can hold without bursting: [Agenda 21 Chapter 5](#)

HUMAN POPULATION: RESOURCES

The world's growing population and unsustainable consumption patterns are putting increasing stress on air, land, and energy resources: [Agenda 21 Chapter 5](#)

LAND

There's only so much land in our world. Expanding human requirements are increasing pressures on it, creating competition and conflicts: [Agenda 21 Chapter 12](#)

OCEANS: DAMAGE

Oceans are under increasing stress from pollution, over fishing and general degradation. It affects everything from the climate to coral reefs: [Agenda 21 Chapter 17](#)

OCEANS: POLLUTION CONTROL

Nations must commit themselves to control and reduce the pollution of the marine environment and maintain its life support capacity: [Agenda 21 Chapter 17](#)

OZONE

Our atmosphere is under increasing pressure from greenhouse gases which threaten to change the climate and holes in the ozone layer which cause cancers in humans and animals: [Agenda 21, Chapter 9](#)

POVERTY CAUSES

The root causes of poverty are hunger, illiteracy, inadequate medical care, unemployment and population pressures: [Agenda 21 Chapter 3](#)

PUBLIC PARTICIPATION

Fundamental to the achievement of sustainable development is broad public participation by all major social groups: [Agenda 21 Chapters 23, 24, 26, 27, 29, 30 & 32](#).

RESPONSIBILITY FOR IMPLEMENTATION

Agenda 21 reflects a global consensus at the highest level. Its successful implementation is first and foremost the responsibility of governments...
[Agenda 21 Preamble](#)

ROLE OF CHILDREN: POLICIES

Each country should include children's concerns in all relevant policies for environment and development and support their development in the United Nations: [Agenda 21 Chapter 25](#)

ROLE OF CHILDREN IN GOVERNMENT

Each country should provide children with opportunity to present their views on government decisions: [Agenda 21 Chapter 25](#)

ROLE OF LOCAL AUTHORITIES

Local authorities, at the level of government closest to people, have a vital role in educating and mobilising the public to get behind the goals of Agenda 21: [Agenda 21 Chapter 28](#)

ROLE OF SCIENTISTS

Scientists and technologists have special responsibilities to search for knowledge and to help protect the biosphere: [Agenda 21 Chapters 31, 34, & 35](#)

RURAL POVERTY

Poverty is a major factor in soil degradation. We need to restore fragile lands and find new jobs for farmers thrown out of work... [Agenda 21 Chapter 12](#)

SOIL EROSION

Mountain ecosystems are suffering from soil erosion, landslides and the rapid loss of animals and plant life: [Agenda 21 Chapter 13](#)

TRADE

Developing nations need free trade and access to markets, in order to achieve the economic growth that will enable them to grow in a sustainable way: [Agenda 21 Chapter 33](#)

UNITED NATION'S ROLE

The United Nations is uniquely placed to help governments achieve the objectives of Agenda 21. The UN itself should rebuild and revitalise itself around these goals: [Agenda 21 Chapters 37 & 38](#)

WAR

Warfare is inherently destructive of sustainable development, so effective laws, respected by all states are needed: [Rio Declaration Principle 24](#)

WASTE MANAGEMENT

Prevent or minimise the generation of waste. This should be part of an overall cleaner production approach; by 2010, all countries should have national plans for waste management: [Agenda 21 Chapters 20 & 22](#)

WASTE

Unsustainable consumption, particularly in industrialised nations, is increasing the amount and variety of wastes. Quantities could increase four to five-fold by the year 2025: [Agenda 21 Chapters 20, 21 & 22](#)

WATER IN THE HOME

By the year 2000, all city people should be provided with 40 litres of safe drinking water daily. By the year 2025, there should be safe water and sanitation for all: [Agenda 21 Chapter 18](#)

WEALTH AND CARRYING CAPACITY

We've got to develop new concepts of wealth and prosperity which are more in harmony with the Earth's carrying capacity: [Agenda 21 Chapter 4](#)

5.06 Important Action Points

The following statements were made by the children's Agenda 21 team to summarise the actions required to implement the Rio resolutions.

- 1 Promote energy efficiency standards
- 2 Tax industries in ways that encourage the use of clean, safe technologies
- 3 Improve substitutes for CFCs and other ozone-depleting substances.
- 4 Get all these technologies transferred to poor countries!
- 5 Deal with acid rain that floats across frontiers by having regular exchanges of information, training experts and applying international standards of pollution control
- 6 Increase knowledge of mountain and desert ecosystems by having a world information centre and identify areas most at risk from floods, soil erosion etc.
- 7 Give farmers environmental education
- 8 Prevent desertification by not polluting soil, by using land soundly and by planting trees that retain water and soil quality
- 9 Pass laws to protect endangered areas
- 10 Make plans to ensure that potential drought victims survive
- 11 Plant new forests

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12 Practical knowledge on the state of forests is needed; planners often lack even basic information on size and types of trees in forests.

13 Further research is needed into forest products like wood, fruits, nuts, dyes, medicines, gums etc.

14 Replant damaged areas of woodland

15 Breed trees that are more resistant to environmental pressures

16 Local business people should be encouraged to set up small forest enterprises.

17 Limit and aim to stop slash-and-burn farming methods

18 Keep wood waste to a minimum. Find ways of using trees that have been burnt or thrown out

19 Increase tree planting- in towns and cities

20 Protect and check environmental damage to coastal areas nationally and internationally

21 Polluters should pay for the damage they cause. Those using cleaner methods should be rewarded

22 Protect marine life by controlling what materials may be removed from ships at sea and by banning removal of hazardous waste

23 Nations should share new technologies

24 Set limit on how many fish may be caught

25 Encourage fishing by skilled local people

26 Stop fishing for species at risk until they are back up to their normal numbers

27 Ban destructive fishing practices - dynamiting, poisoning and others; develop new practices to replace them

28 Prepare sustainable development plans for small island states

29 Support the islands indigenous culture

30 Set up high-level policy-making bodies to cooperate with Non-Governmental groups to put these plans into effect

31 Create a world information resource for biodiversity

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- 32 Protect biodiversity! This should be a part of all government plans on environment and development
- 33 Offer indigenous peoples the chance to contribute to biodiversity conservation
- 34 Make sure that poor countries share equally in the commercial exploitation of their products and experience
- 35 Protect and repair damaged habitats; conserve endangered species
- 36 Assess every big project- dams, roads etc.- for its environmental impact
- 37 Eliminate guinea-worm disease, polio, river blindness and leprosy completely
- 38 Reduce and control tuberculosis and measles, and cut childhood deaths due to diarrhoea by 50 to 70%
- 39 Protect mothers. Provide them with the means to choose the number and spacing of their babies; allow them to breast feed their babies for the first four months of life
- 40 Immunise all children; protect them from sexual and workplace exploitation
- 41 Use effective traditional knowledge in national health care systems
- 42 All nations to identify environmental health hazards and take steps to reduce them
- 43 Coordinate national efforts to control the spread of the HIV "Aids" virus
- 44 Put anti-malaria programmes in place everywhere malaria is still a problem
- 45 Establish standards for industrial hygiene, use of pesticides, maximum permitted safe noise and exposure levels to ultraviolet radiation
- 46 Protect vulnerable groups, particularly the elderly and disabled population
- 47 Reduce consumption; use less energy
- 48 Eco-label less harmful products
- 49 Make eco-friendly products cheaper by taxing eco-harmful ones

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- 50 Tax industry that pollutes or spoils limited nature resources; support eco-friendly industry
- 51 Develop sources of renewable energy
- 52 Help developing countries in building their economies based on utilising renewable sources of energy
- 53 Reduce waste, recycle and tax packaging materials
- 54 Require that industry in developed countries adopt cleaner production methods and promote the transfer of low waste production methods to developing countries
- 55 Give the people the right to know the risks of chemicals they are exposed to
- 56 Immediately clean up contaminated areas and give help to their inhabitants
- 57 Make polluters pay clean up costs
- 58 Ensure that the military disposes of their hazardous waste properly
- 59 Ban illegal export of hazardous waste to countries not equipped to deal with it
- 60 Minimise creation of radioactive waste
- 61 Bring together everyone who works on the land for planning meetings; local farmers, women, managers, business people, local officials, sales agents, scientists, government officials.
- 62 Make laws to end the devastation of land by mining (polluter pays principle)
- 63 Governments must provide advice to farmers on environmentally friendly fertilisers
- 64 All farmers must be educated in methods of preserving topsoil
- 65 Encourage farmers to switch to renewable energy sources
- 66 Tell farmers about the problem of ultraviolet rays reaching their crops; research ways to minimise the effects of loss of the ozone layer and global warming
- 67 Raise people's awareness through education and campaigns
- 68 Develop National Agenda 21s to make sure that new laws aren't just good for the economy but for people and the environment as well
- 69 Provide technical support to countries who can't enforce environmental laws
- 70 Tax products that aren't ecologically friendly so that people will buy those products that don't harm the environment

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71 Introduce environmental accounting; governments and businesses must stop thinking of natural resources as free sources of profit. For example, they must include the cost of re-growing a forest in the 'cost' side of their accounts

72 Have more women decision makers, planners, scientists!

73 Set up education programmes so all women can learn to read and write

74 Make sure women in developing countries have rights to own land and get credit from banks

75 Make women aware of the environmental consequences of what they buy through eco-labelling, especially in rich countries

76 Help set up child care so more women can go to work

77 Do everything possible to stop violence against women

78 Get close communication between governments and NGOs

79 Co-operation between governments and NGOs themselves should be increased

80 UN agencies should support NGOs

81 Freedom for NGOs to say things and promote ideas that governments and industry might not like must be guaranteed

82 Workers should take part in all decisions, co-operating with both employers and governments

83 Trade unions should promote worker education and training in work health and safety

84 Environmental management should be given a lot of importance and national business councils should be set up for that purpose

85 Measures should be taken to reduce the industry's impact on the environment and develop cleaner production methods

86 Let indigenous peoples take an active part in all political decisions affecting them and their land

87 Respect and protect the property and culture of indigenous people

88 Give more responsibility to farmers

89 Develop farming practices and technologies that are safe for the environment

90 Farmers should share knowledge on conservation of natural resources

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- 91 Bring ecology into agricultural training
- 92 Prices of agricultural products need to reflect environmental costs
- 93 Local governments should draw up their own agenda 21s to reshape the policies, laws and regulations of their districts
- 94 Local governments should work with international organisations and with each other to gain new ideas.
- 95 By 1994 local governments should be linked at an international level
- 96 By 1996 each local authority must present their local Agenda 21
- 97 There is a need:-
 - For the world to help low and middle income developing countries to deal with the problem of foreign debt
 - For higher levels of foreign investment
 - For the transfer of clean and efficient technologies
 - For free trade and access to markets so as to achieve economic growth
- 98 Funds could be raised by reallocating resources now committed to the military
- 99 Make basic education available to as many people as possible
- 100 Set up training programmes on sustainable development
- 101 Promote awareness on environment, and make use of media and the entertainment industry
- 102 Promote the knowledge of indigenous people
- 103 Create partnerships with companies in the developing countries to teach environmental management

5.07 How should we act?

As we edited this book, we thought of the thousands of kids who have worked on it who'd like to be here with us now. We've read their summaries, seen their pictures and they've inspired us. We'd like kids everywhere to become a part of this Rescue Mission, to get access to leaders with their ideas and concerns. It cannot just be an elite. There's only one way to do this in a fair way; to build a Global Democracy of Children.

How?! How on earth could 2.5 billion human beings under the age of 18 be connected in a way that would be democratic without being bureaucratic? How could we enter in the adult's decision-making process without starting to be as boring as them?

The first thing to do is to select issues not representatives. That way, we can all choose what we want to talk about, after which the question of who does the talking is less important. The first place to organise is in our schools. Each Rescue Mission will start with a conference where we would decide the issues and elect a small action council to see things get done. Like the Children's Councils in France, we will have regular access to local government and work with them, perhaps to organise the local Agenda 21.

5.08 Children's Councils

They started in Strasbourg France. A Mayor wanted children's advice on a plan for the town so he got the schools to elect a children's council. It helped, not just with that plan but with many others! Now, in 700 towns and villages across France, children elect their own official council to shadow the work of the adult council and approve their decisions. They also choose "action programmes" to carry out some of the ideas they have promoted.

The movement has had an impact right up to national level: politicians see it as a way of giving young people experience in democracy and getting them interested in their local communities. The idea has spread to Italy, Austria and Germany. You could start one in your town.

5.09 Get Connected!

Anybody, Somebody and Everybody knew there was a job to be done
Anybody could do it and Everybody thought that Somebody would do it.
But in the end, Nobody did it.

We've found that being together working on this book makes us feel incredibly powerful. We all dread going home- being alone again. That's why we are determined to stay in touch with the way we feel now. Just knowing that there are people like us, concerned about the same things on the other side of the world, helps. If you feel the same, get connected! Together we will be unstoppable.

The key to it all is keeping in touch with each other. This is hard to do with the language differences, distances, phone bills etc. The solution is to set up a series of Youth Centres around the world, run by young people from different countries. Their job would be to help set up and promote the Action Councils and to keep in touch with each other. The Rescue Mission will be promoted chiefly through the many existing eco-groups, scouts, guides etc. The Youth Centres will simply promote and network their work and success around the world

5.10 Target Dates

1995 - Pilot local offices in every region
1998- National meetings in every country
2000- Complete global democracy of youth.

5.11 The Response of Teachers and Children in Wales

The school-based local environmental action plan (SCAN) is an idea developed in 1994 in a partnership between the Dyfed area teachers advisory service, local schools in Pembrokeshire, and the National Museum of Wales in Cardiff, to encourage schools to help the communities they serve to take action in the spirit of Agenda 21 of the Rio Conference on the Environment. The stimulus came from the International Children's Agenda 21 published in 1994 by 'Peace Child International'. The SCAN methodology is based on two national campaigns that use standard question forms designed to heighten local environmental awareness. 'Jigso' is a Welsh campaign to encourage the adult section of communities to question the way their environment looks and works, and then gather resources to improve it. 'Enviroscope' is a package devised in 1993 for a UK wide environmental survey to be used by children (8 to 13 age range) in families and schools.

5.12 SCAN's Aim and Objectives

The aim of SCAN is to adapt, integrate, and extend the interrogative approaches of Jigso and Enviroscope to set up, and maintain, a special school bulletin board which shows the problems, issues and challenges of development in the community served by the school. An important practical objective is to create and update a local children's environmental action plan to be communicated to the community served by the school at regular intervals, and passed on to other schools.

The beginning is a set of local 'postcards' produced by individuals and groups, each of which encapsulates a local environmental improvement (actual or needed).

This simple geographical information system is an 'eye-opener' which is followed up with regular environmental auditing, using simple questionnaires related to information relevant to local implementation of the UK Government's action plans for sustainable development and biodiversity.

A general audit can start by finding answers to the following questions.

- What is special about the place where we live?
- What can we do to conserve and improve it?
- What are the problems, issues and challenges of local development?
- How can we act locally?
- What should we be telling our community?
- How can we communicate with other communities?

A detailed audit can be based on questions of the Jigso/Enviroscope type, customised in school to the local situation, for gathering information on 'geographical place', 'biological place' and 'socio-economic place'.

The answers to the questions will encapsulate the local problems, issues and challenges of development, and indicate actions required to meet the Agenda 21 framework. The action plan can be transmitted to the local community and other groups.

Other learning advantages that stem from the project are:-

- it creates a cross-curricular teaching resource to meet classroom subject-objectives using local information;
- it is a practical method of running the 'citizens environmental networks', and local 'environmental warden' schemes, the Government recommends to promote its Rio action plans;
- it gives a boost to IT through databasing the responses to the questions and communicating the database to other groups;
- it encourages involvement with systems-thinking about environmental protection by pointing towards the need for the resourcing and management of environmental projects .

5.13 The Approach

SCAN models are simplified views of the local environment. A photograph, a painting or a poem, which highlights a problem, are all models representing a personal view of 'home'. Maps, diagrams, mathematical equations, and a small-scale three-dimensional static, or working, systems, are models designed to analyse local problems. They are usually made as a first attempt to understand our more complex world,, in order to solve a problem by creating an action plan. The Welsh Jigso campaign recommends that the community first maps its local area before embarking on a detailed survey. Many of these map-models turn out to be pictorial tapestries or scrap books which link places with important natural/historical features.

There is obviously an educational progression from drawing a picture to doing something practical. In this sense modelling the local environment at school can be a progressive and co-operative activity across age and curriculum. As a co-operative activity it is also a powerful learning experience for future living.

Ultimately, modelling is a basic approach to simplifying systems that are too complex to handle. A local environmental action plan has to be based on a simplified dynamic model of nature/people/landscape, highlighting those features that are limiting improvement to a desired state.

For example, an easy way to begin a dynamic community model is to delineate its past and present water features. This not only lays down the cultural thread binding the first settlers to the modern inhabitants, but also points to connections with other communities currently sharing the watershed. Watersheds are useful environmental management units.

To enter a bigger picture, there is the local estuary, lake, reservoir, water treatment works, or industrial user; entry points to management systems.

In summary, anyone at any age can 'make a SCAN' with a picture. Older groups can build dynamic models, ultimately drawing upon the nearest information agency/industry for involvement with the latest environmental knowledge and its applications. These links could be the starting point for inter-country connections, sharing ideas and teaching resources.

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For example, in Wales, the dominance of a heavily used coastline points to the local value of modelling estuaries and their problems, issues and challenges. The Estuaries of the Dee and Severn are common to communities in Wales and England. The international picture emerges through communications with schools in other countries. E-mail links based on the making of SCANS have already been established between schools in Wales, Portugal (Tajo and Sado estuaries) and the USA (Chesapeake Bay).

6.0 NATURAL ECONOMY

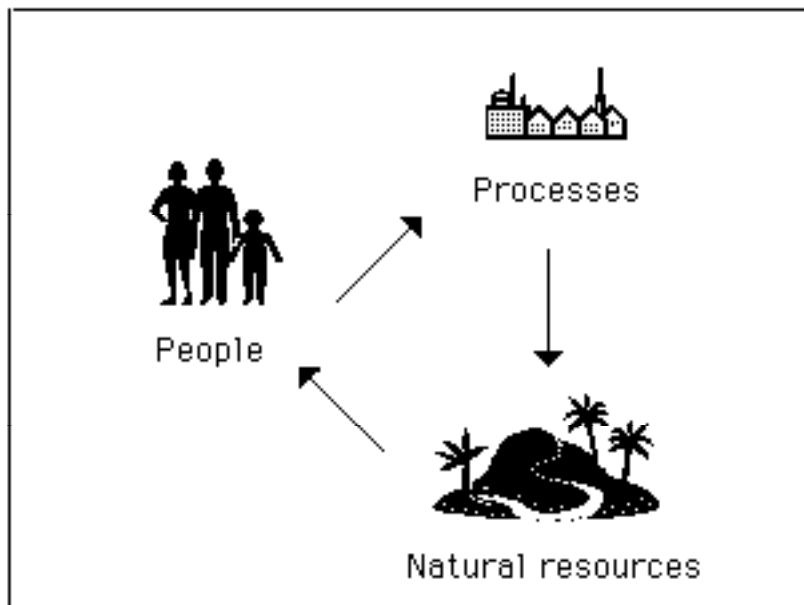
A knowledge navigation system

- 6.01 Definition
- 6.02 Synoptic model of world development
- 6.03 People and Place
- 6.04 Flows in a Natural Economy
- 6.05 Social Production Systems
- 6.06 Ethnoecology and Ecomenes
- 6.07 The Conservation Culture
- 6.08 Sustainable Economic Development
- 6.09 Focus on Landscapes
- 6.10 Knowledge Maps

6.01 Definition

Natural economy is a navigation system to voyage the relationships between people and the processes they invent to use local natural resources for survival, social cohesion, and economic development (Fig 6.01).

Fig 6.01 Natural economy as a dynamic model of world development



It is a synoptic model of the development and spread of culture that focuses on location and land-use decisions. These decisions are specific to certain times and places, involving the learning of skills and technologies to make a living from processing local materials and energy flows.

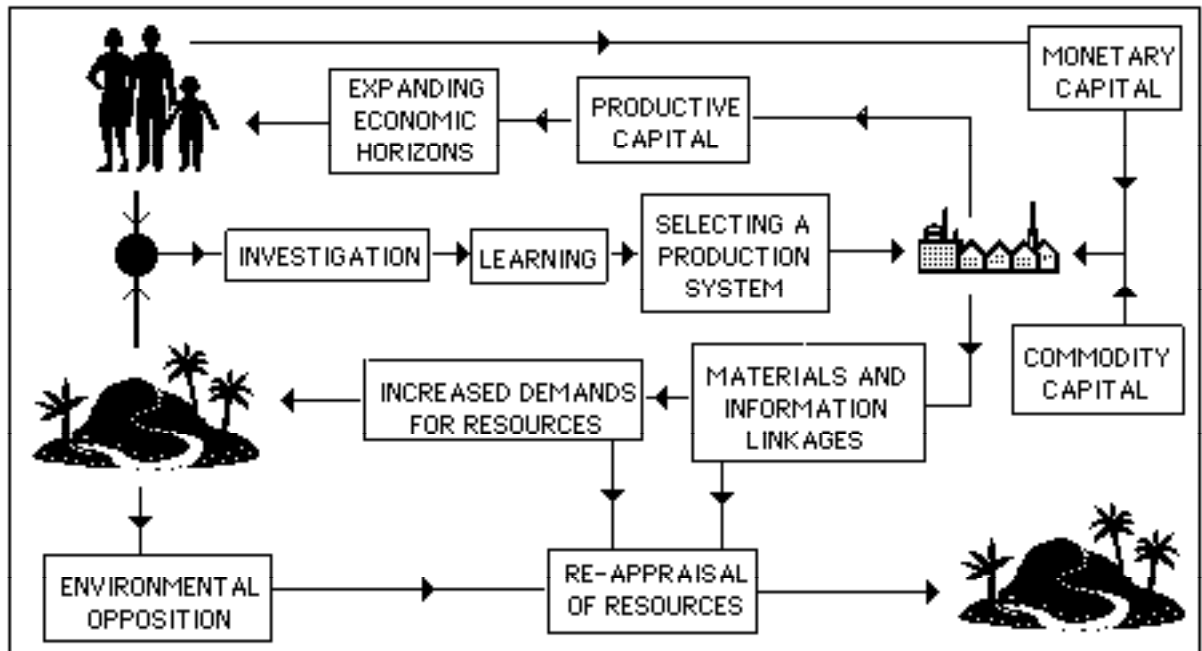
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Particular local cultural models are defined in terms of:-

- the resource base providing food, energy and materials;
- the processing skills for getting food, and crafting objects and constructions;
- the cultural area;
- the family and group customs;

In this sense, natural economy is an educational development of the Sauer/Harvey 1963-67 model of principles that govern human organisation over space, and the management of natural resources for their sustainability (Fig 6.02). The model has been generalised to include native pre-industrial, non-monetary economies from which there are lessons to be learned about living in ecological harmony with the local resource base.

Fig 6.02 A synoptic model of the development and spread of human culture through the circuit of capitalism which varies temporally and sectorially.



Examples of recent monetary economies categorised by their dependence on particular natural resources, are fisheries, pastoralism and woodcraft. These may be taken as a natural analogue models of world development because:

- they represent the development of ancient cultural uses of natural resources that are becoming extinct in the modern world;
- they each express a management system, based on ecological cycles and climatic fluctuations, with yields that have to be coupled to the linear processes of economic growth;
- they have a long tradition of applied research into the mass cropping and competitive use of natural resources;
- they involve the continuous cropping of ecosystems that are losing diversity and are under threat from industrialisation;
- they allow global spatial comparisons to be made in all of their dimensions.

6.03 People and Place

Natural economy is the human behavioural superstructure that governs the use of 'natural', or day to day **local** living space. People and space are integrated through a cultural emphasis on production systems which use locally evolved, idiosyncratic symbols, facilities and tools. In contrast, the monetary economy operates in the **global** space of national and international politics, which emphasises the standardised methods of mass production, commercialism and monetary flows. We need to distinguish concepts that define the cultural ordering of space from those that define the monetary ordering of space, because the cultural and economic maps cannot always be superimposed, and cultural heritage, as a local cultural stabilising force, predates the world economy.

Natural economy defines the behavioural evolution of localised social groups from the small vernacular theatres of pre industrial economic units to the international arena of communities dependent on industrial mass production. The beginnings were the primeval technological expressions of localised social systems which tapped natural resources to supply human needs and wants. This produced the first local impacts which turned 'ecosystems' into 'landscapes'. Natural economy is now expressed historically through the dynamic biophysical mosaic of complex landscapes that have been produced by abstraction of natural resources by past and present developments of local economies.

The economising techniques of industrialism are:-

- intensive research;
- financial capital;
- sources of cheap power;
- invention of machines for specialised jobs,;
- education and training for jobs, rather than crafts, among the working population;
- and construction of infrastructures of transport and communication for circulation of people, goods and ideas.

These outcomes of technological invention have produced the typical features of the modern commercial world.

6.04 Flows in a Natural Economy

The natural economy model (Fig 6.03) defines landscape dynamically as a cultural base resulting from the interaction of the following basic flows;

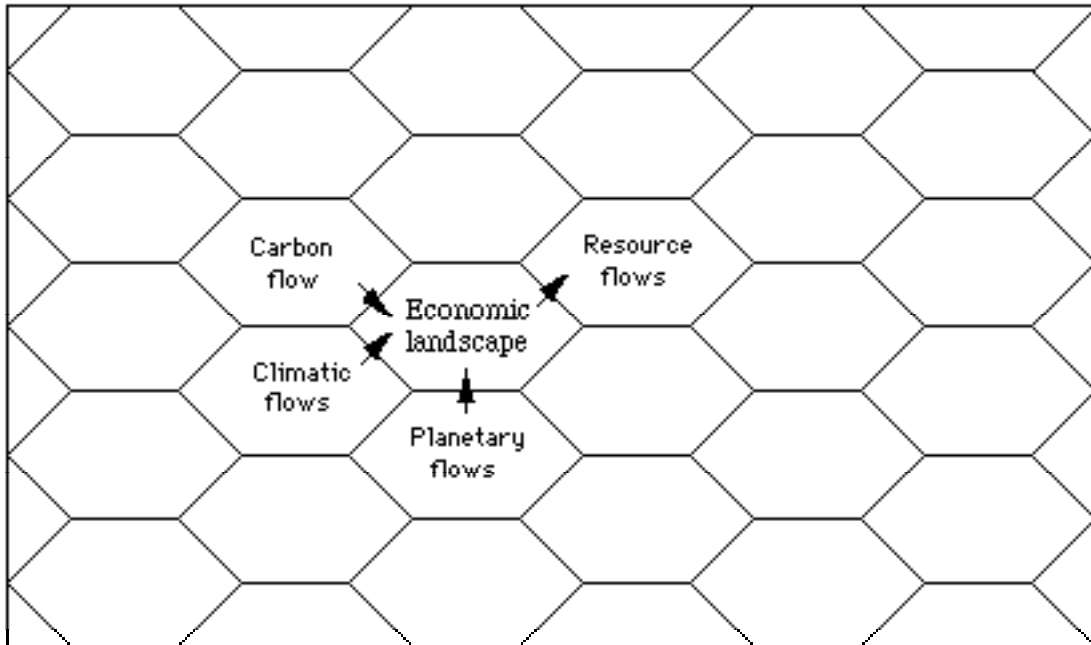
- flows of natural resources into human societies, supported, and influenced by:-
- flows of carbon through biological systems;
- flows of climatic energy, which impact locally as heat, wind, rainfall/ice, tides and ocean currents;
- flows of planetary energy, from the earth's inner structure and its molten core, expressed in earth movements and local geological hot-spots, where heat, and/or magma reaches the surface.

The different flows are characterised as follows:-

- flows of natural resources are expressions of the **human economy**;
- flows of photosynthetic carbon and climatic flows of air and water are expressions of the **solar economy**;

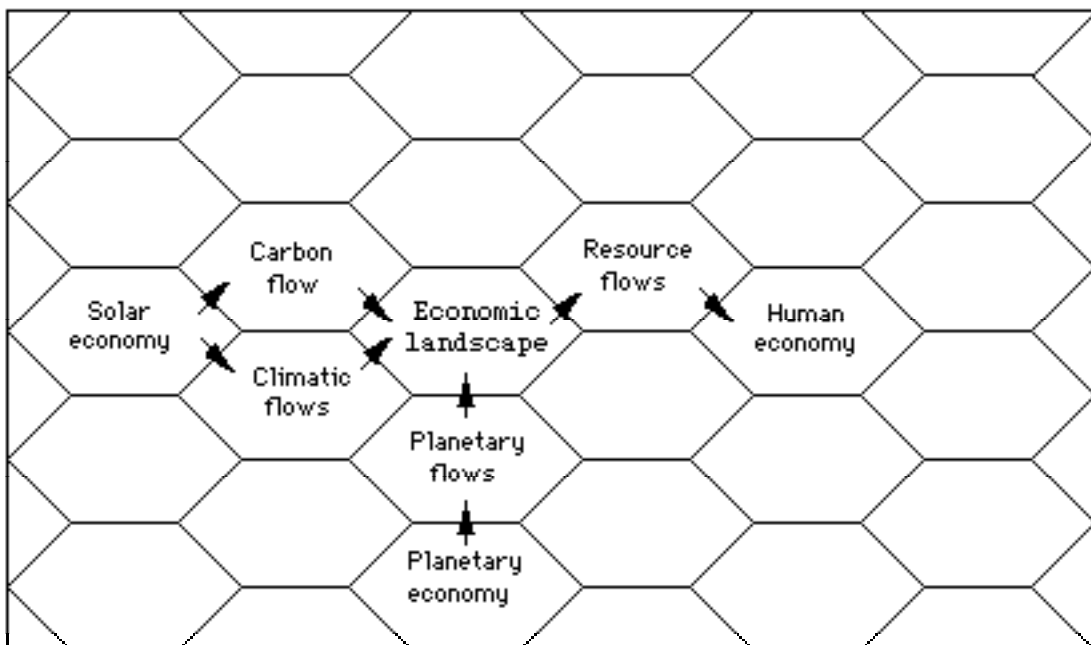
- geological flows of materials and energy arising from processes in the earth's crust and core are expressions of the **planetary economy**.

Fig 6.03 The materials and energy flows of natural economy focusing on the local economic landscape



The three distinct economies set the conceptual boundaries to every natural economy. This perspective is completed diagrammatically in the array set out in Fig 6.04.

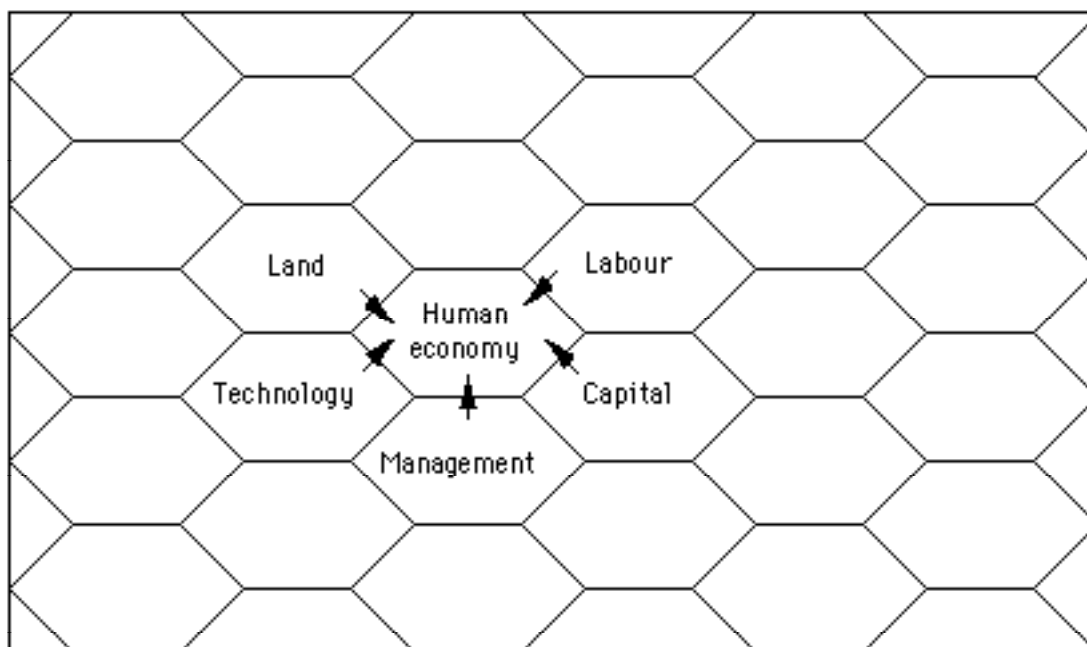
Fig 6.04 The three 'economies' which contribute to flows of natural resources in a particular economic landscape.



The main local inputs to any system of natural resource utilisation (Fig 6.05) are:-

- **land** (for obtaining the resources, and for living and processing them);
- **technology** (the outcome of local inventiveness and construction skills);
- **labour** (the availability of people to make a worthwhile production system);
- **management** (the organisation of human skills to make a production system);
- and **capital** (some form of local wealth for investment in labour and **technology**, that can be augmented by trading products).

Fig 6.05 Major factors contributing to the human economy



6.05 Social Production Systems

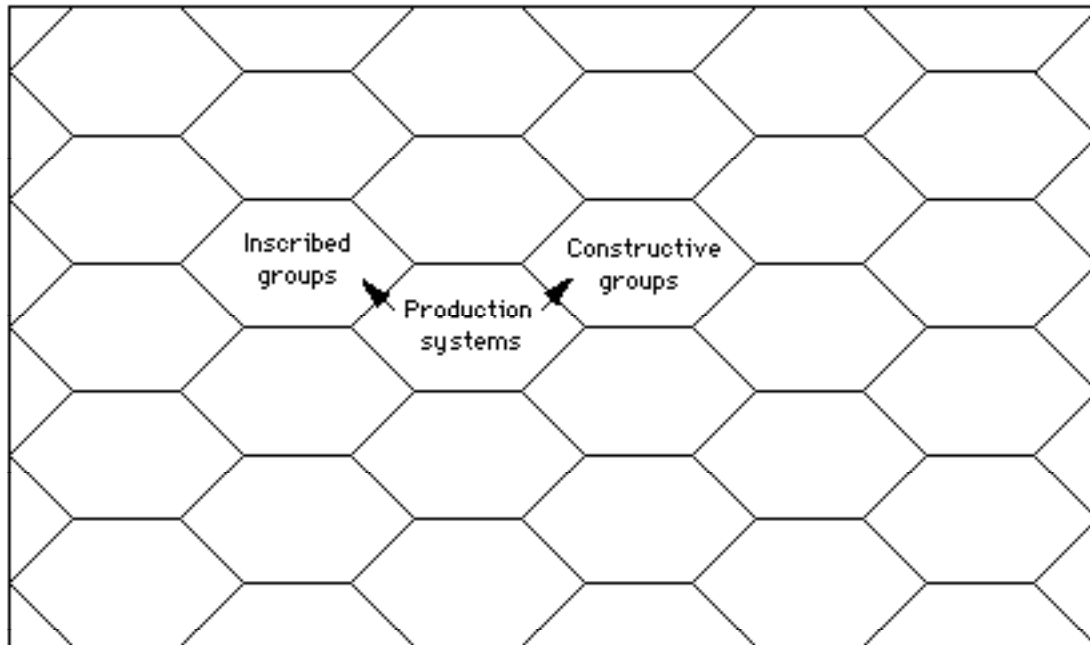
Scientifically, natural economy delineates the inventions and technologies by which the earth's biophysical economies are drawn into the human economy to generate wealth. The creation of wealth allows financial investment in the exploitation of more natural resources. This in turn increases wealth still further. World development has so far proceeded on this basis. It is an example of positive feedback because use of natural resources stimulates their increased use. A more effective management of flows of natural resources into the human economy creates a demand for the consumption of ever more and more natural resources.

This positive feedback system of consumerism is illustrated in the development of two kinds of social groups which drive the economic transformation of materials and energy flows into goods and services (Fig 6.06).

Modern production systems are characteristic of '**constructive groups**' who construct a landscape to serve their economic aspirations, populating it beyond the limits of the local natural productivity, importing goods and services from elsewhere, thereby destroying its ecosystems. Ancient production systems on the other hand are characteristic of '**inscribed groups**', who organise their society for the sustained exploitation of local

natural resources. They are inscribed, or embedded, into local ecosystems by being linked to the productivity of local biophysical flows. These links limit the number of people who can partake of the local resources.

Fig 6.06 Production systems defined in terms of the bonds between the community and its local natural resources.



The natural economy of inscribed groups involves each unit taking in and processing commodities right to the point where they are ready for the consumer as final products. The products of these **consumer-economies** are intended for permanent or terminal use in the form in which they are acquired. They are not for incorporation by other producers into more developed and complex products, and are not subject to further exchange. Strong folk arts and traditional crafts are a feature of consumer economies.

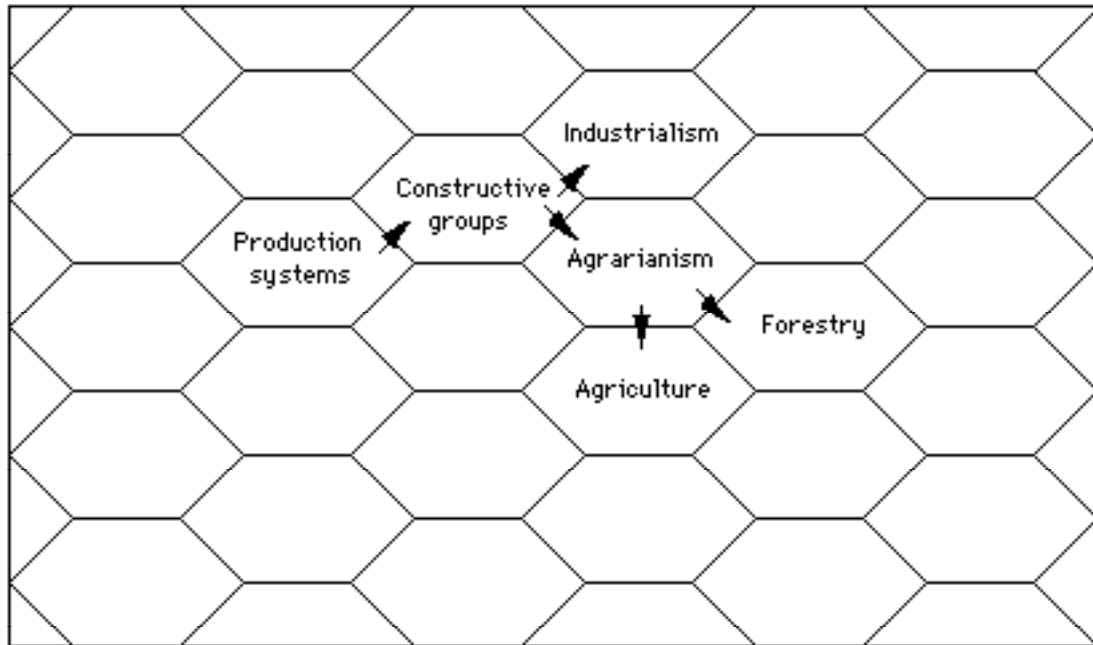
In contrast to the economies of inscribed groups, the systems of constructive groups express **producer-economies**. They are organised to effect a transfer of goods from one producer to another in unfinished form. The consumer is at the end of a long line of producers each of whom has added something to the final product. Industrialism and agrarianism are examples of production systems of constructive groups (Fig 6.07). Agrarianism is now dominated by the mass production of crops through agriculture and plantation forestry, which are sold on for others to 'add value'.

World development has progressed as 'consumer-orientated' craft production has given way to producer-orientated mass production systems. Mass production is the characteristic of industrialism. The inputs of natural resources are managed to supply markets and exchanges with goods and services to meet demands of wage-earning urban peoples who now dominate population structure throughout the world.

The constructive group system presented in Fig 6.07 is an expansion of that already discussed in relation to Fig 6.03. It is driven by the widespread desire to generate wealth.

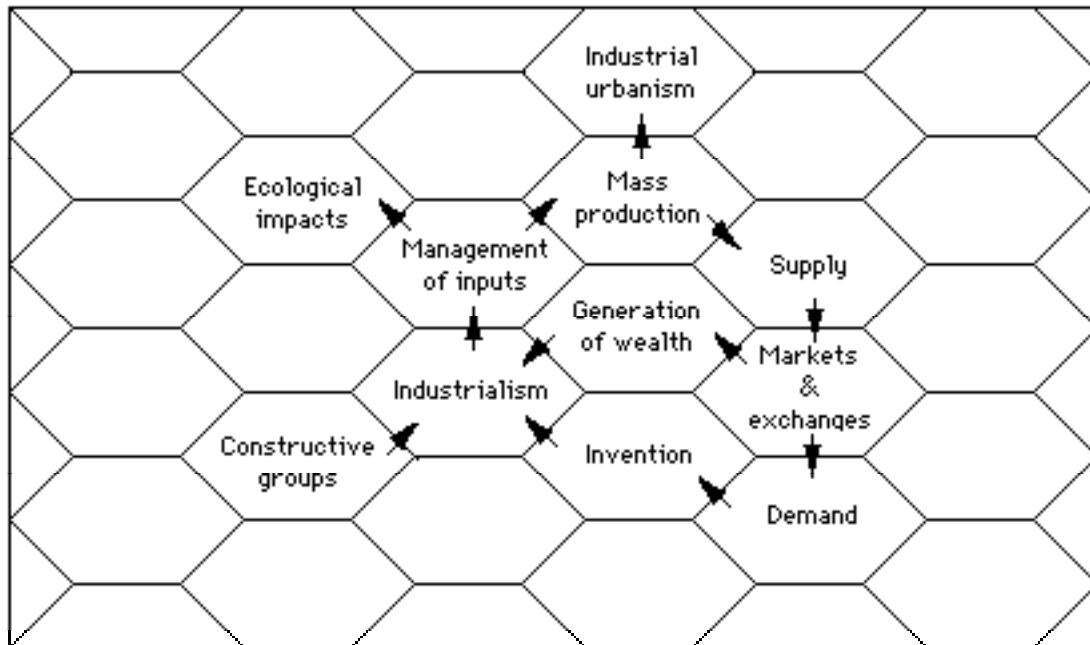
Industrial wealth capitalises the application of new ideas, technological inventions, and mass advertising to increase the output of cheaper products and boost demand for the 'new and better'.

Fig 6.07 Production systems of constructive groups



Now that agriculture and forestry, the two modern dominant expressions of agrarianism, have developed in this direction, 'industrialism' and 'agrarianism' are interchangeable concepts in Fig 96.08. The main difference between a map of manufacturing industry in Fig 6.07 and that of modern agriculture is the hex labelled 'industrial urbanism' would be named 'rural depopulation/deprivation'.

Fig 6.08 The economic system of industrialism and agrarianism



6.06 Ethnoecology and Ecomenes

Modern industry and agriculture are the production systems of constructive groups. They are organised in production lines and the conservation aspect of self-sufficiency characteristic of early inscribed consumer economies in town and countryside has virtually disappeared. The production systems of ancient pre industrial inscribed groups bound ethnic development to the local ecology. Ethnoecology has been defined as the subject for studying these groups, which are characterised as being either completely, or mainly, self sufficient.

For inscribed groups bound to a particular ecological flow of natural resources yet operating a market economy, the term ecomene was coined by early French geographers. A 19th century European coastal community based on the sustained exploitation of a local fish stock, is an example of an ecomene. An ecomene is a unique combination of people, topography, ideas, skills and capital. The term is still useful today. Various criteria may be used to distinguish an ecomene- language, customs or culture, ideology or religion. Not all of these are applicable in every case but a permanent essential character of an ecomene is the personal recognition of each individual that they belong to a group different from others. They either consume the fruits of their labours themselves, or trade them for immediate use by other groups.

6.07 The Conservation Culture

Ethnoecology is the study of groups that are now extinct, and there are few examples of ecomenes in our uniform industrial world. The modern expressions of inscribed culture are the conservation groups and organisations which define the urban 'green culture'. Conservationists insert the existence value of nature into their industrial economic system in order to sustain the supply of natural resources in the face of our ever increasing

demands on the environment. This approach is needed, not only to sustain supplies for our material wants, but also to meet our spiritual needs. The latter come from contact with 'wild nature' and 'scenic beauty'.

This third element in modern natural economy is really an up to date expression of the behaviours which characterised early inscribed cultures whose needs were sustained by cropping self-renewing seminatural ecosystems. 'Greens' may therefore be viewed as contemporary expressions of the old inscribed cultures. Indeed, many nature reserves can only be maintained by adopting the ancient, uneconomic agrarian production systems which were abandoned in the face of the economic gains to be had from adopting mass production. Conservationists attempt to preserve wildlife and heritage, and place a monetary value on seminatural ecosystems for the various classes of 'natural goods' we can derive from them. For this purpose, individuals, voluntary groups and government agencies promote the conservation of natural resources using some of the wealth of a global mass production economy. The relationships between the different aspects of the production systems of inscribed groups, ancient and modern, are presented in Fig 6.09.

Conservation management is a response to the problems, issues and challenges of natural resource utilisation. It may be visualised as the negative feedback regulator of consumerism activated by the values people place on the resources (Fig 6.10)

Fig 6.09 Production systems of inscribed groups.

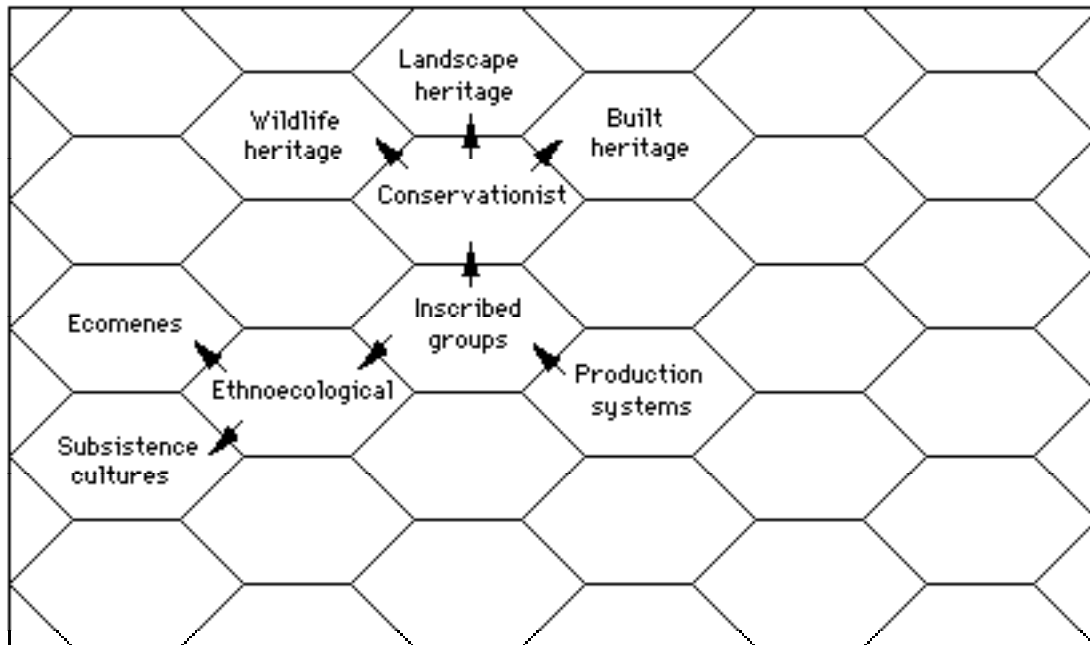
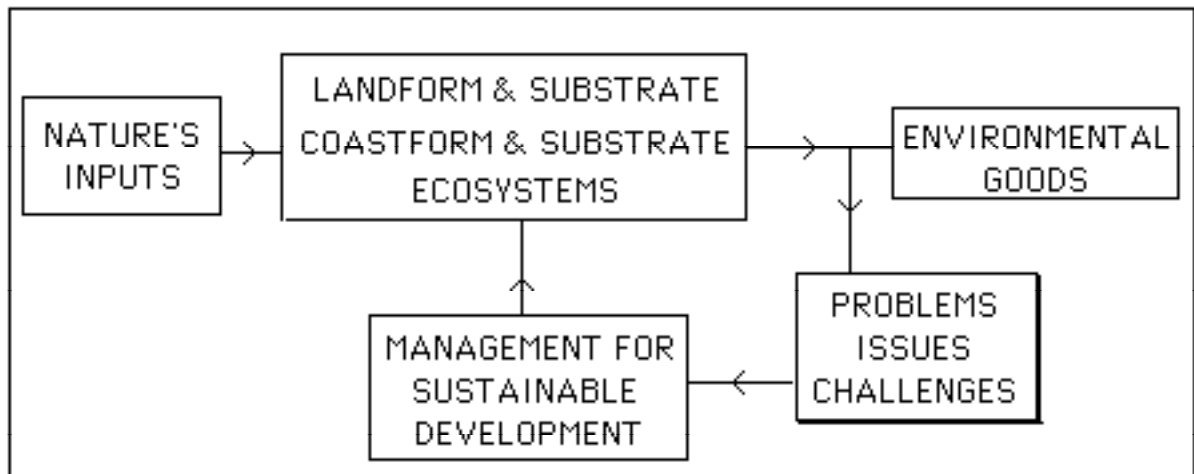


Fig 6.10 A closed-loop conservation model of natural economy



People value stocks of natural resources that are attached to particular supplies of materials and energy that provide 'goods' in the following ways:-

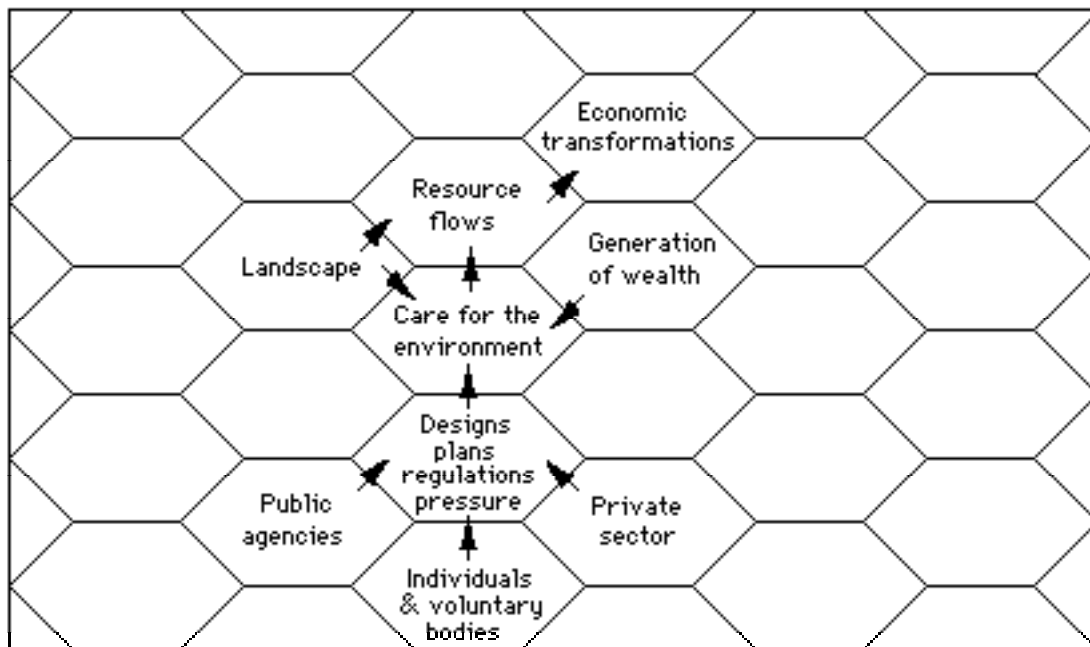
- 'user values', or 'user benefits', derive from the actual use of the stocks, whether for survival or pleasure.
- other kinds of values are expressed through options to use the stocks and 'optional values' are the values of natural resources as potential benefits for future use.

- the third contribution to the economic value of the environment is the existence value of one or more of its elements; 'existence values' are intrinsic and embedded in the actual elements, and are unconnected with their actual or future use; they have been equated with a conservation ethic; this ethic embraces our duty to sentient beings, and ecosystems, and our concern for future generations.

6.08 Sustainable Economic Development

The conservation movement developed as a response to local perceptions that some features, upon which members of the local user-community place a value, were being destroyed or eroded through the economic transformation of a local resource flow. Until the last decade, care for the environment was expressed mainly in the context of managing local landscapes for their aesthetic value and nature reserves because of their rare species. The notion that global conservation of all natural resources should go hand in hand with industrial development has recently taken on a new urgency. It has become apparent that renewable resources are being exploited beyond recovery, and conservation can no longer be seen as peripheral to our quest for social and economic welfare.

Fig 6.11 Environmental care activated by local perception of landscape and promoted by the use of wealth from the economic transformation of natural resources.



A global strategy for conservation based on the view that development depends on conservation, and that conservation depends equally upon development, was promoted by the United Nations Environment Programme in the late 1970s. The strategy aims to advance the achievement of sustainable development through the conservation of natural resources linked with economic growth. Now, after the Rio Environment Summit, nations that were signatories to its Agenda 21 and Biodiversity Convention, are creating their

action plans for sustainable development. All these conservation responses, local and global, must take place through the application of designs, plans, regulations, or social pressure. The responders may be governments public agencies, individuals, voluntary bodies, and the private sector. Every conservation programme requires some form of management/ monitoring system, and special skills and professions to implement it. Environmental care in this sense depends on industrialism because salaries of the professional staff have to be paid for directly or indirectly (e.g. profits forgone) from the wealth generated by those countries operating profitable economies (Fig 6.11). This conceptual structure of a world conservation strategy embodies the option values and existence values of particular environmental features.

6.09 Focus on Landscapes

In summary, most primeval landscapes have been greatly altered by the development of interdependent human communities operating market economies. Development of the British economy has involved clearing the natural woodlands, reclaiming marshland, fen and moor, digging mines, making canals and railways and creating country houses and their parks. All of these activities have made a contribution to the local character of the British countryside.

Natural economy is a conceptualised materials and energy flow model of natural resource utilisation which focuses on various features of these local landscapes. Landscape may be conceptualised as being made up of a physical geological layer, upon which is superimposed a biological layer. Human settlement and land use give rise to a third, constructed layer. Finally, there is the notional layer defined by the mental constructs we place upon the area in art, legend and literature. Each landscape element within each of these layers is either a window (or entry point) into a rural, urban or global model, where it is the biological or physical expression of one of the concepts of world development. Each concept is also a containment cell for the information and data which defines it. The self-assembly of these concepts by linking each one with others to which it is closely related provides a multi-dimensional learning experience. The end result is the delineation of a personal body of knowledge about the management of local materials and energy flows.

This exercise has a practical value in that every feature of a landscape is the tip of a knowledge 'iceberg', with a base bumping against others. For successful management of local natural resources these icebergs have to be delineated for successful navigation through the multi-dimensional issues facing resource managers.

6.10 Knowledge Maps

Natural economy has been presented as a model of human development in the form of a progression of figures that may be described as 'learning frames'. Each frame is an arrangement of key concepts of human social organisation as a 'map' or 'field of action'. It has been explained that this conceptual system offers advantages in presenting cross-curricular knowledge about world development as a self-contained structured whole. Together, they make a knowledge navigation system that can be used by a learner to place a particular topic in a broad context of other topics to which is related. Research into the way learners perceive cartographic maps as a system of communication indicate that

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children cannot orientate themselves spatially within an areal unit until they are 13 or older. On the other hand the ability to assemble picture jigsaws is evident at a pre-school level. This suggests opportunities to stimulate conceptual learning about world development at an earlier age by assembling concepts identified with clear pictographic descriptors.

Tabulation is the usual method of presenting a cross-curricular theme. A table of contents approach is a simplification which reduces the number of variables. It does this by confining the learner to compartments. In contrast, a conceptual array addresses the need to develop a capacity to handle effectively a large number of variables.

7.0 BIOLOGICAL DIVERSITY

- 7.01 What is 'biodiversity'?
- 7.02 Advantages of Conserving Biodiversity
- 7.03 Loss of biodiversity
- 7.04 Sustainability

7.01 What is 'biodiversity'?

Viewed from the air, the tropical forest of Brazil, Indonesia, or Zaire is still a vast carpet of green, broken by occasional village clearings, rivers, and hills. These forests and waters support a great diversity of species. They have evolved there to live as communities of interdependent plants, animals and microbes in ecosystems. An ecosystem becomes a natural resource when people begin to appreciate its potential utility. Problems of sustaining the resource arise when governments and/or local people increase their demands on the resources, and exploit them faster than they can be replenished.

Britain's wildlife resources have been declining even from the time when they were first beginning to be appreciated. In 1874, James Harting, in his preface to his edition of Gilbert White's writings said:-

If any apology be deemed necessary for the appearance of a new edition of one of the most delightful books in the English language, the reader need only be reminded of the physical changes which have taken place since Gilbert White's day in the district of which he wrote, and of the vast additions which are daily being made to our knowledge in almost every branch of natural history.

Wolmer Forest, which eighty years ago was "without one standing tree in the whole extent", is now partly enclosed, and planted to the extent of several hundred acres with oak, larch, and Scotch fir. Bin's Pond, a "considerable lake," which at one time "afforded a safe and pleasing shelter to wild ducks, teals, and snipe", has long since been drained, and cattle now graze on its bed. The covert in which foxes and pheasants formerly abounded has almost entirely disappeared.

The variety of plants and animals in an ecosystem, and the area it occupies, is a measure of its potential value, and its long-term stability. Depletion of natural resources is costly to society at large, and the concept of biodiversity is central to managing ecosystems to sustain their yields and stabilise other systems which depend upon them. The Biodiversity Convention of the Rio Environment Summit is an agreement of world leaders that the management of biodiversity should be given high priority in our systems of economic planning and education.

Biodiversity is a word invented by scientists as short-hand for 'biological diversity'. It includes all kinds of variation in living things; what they look like, and how they live- in other words the variety of life. 'Biodiversity' is now commonly used to describe the list of all living things found in a particular place.

In 1992, at the Rio de Janeiro 'Earth Summit', a contract was signed by 150 countries to treasure their biodiversity, and protect it against any activity that would diminish it. Protection requires the support of everybody, but unfortunately, biodiversity is a difficult idea to grasp. People have much to learn before they can value all living things, and choose to pay for their protection, rather than buy a 'new car, or 'air conditioning'.

Biodiversity, simply stated, is the variety and variability among living organisms and the communities in which they occur. Measurements of biodiversity define the level of nature's variety. It can be measured in terms of the number and frequency of ecosystems, species, or genes in a given space. It is usually considered at four different levels, ecosystem diversity", community diversity", "species diversity," and "genetic diversity." Action plans to support the Biodiversity Convention are now being produced for ecosystems and species at national and local levels.

Ecosystem Diversity

Ecosystem diversity is a concept of spatial diversity of group of species. It recognises that species are dependent upon a particular kind of physical/biological habitat which supports an ecosystem (e.g. tropical rain forest and northern deciduous forest).

The diversity of ecosystems relates to the diversity and health of the communities to which species belong. Ecosystems provide natural cycles of nutrients (from production to consumption and decomposition), of water, of oxygen and carbon dioxide (thereby affecting the climate), and of other chemicals like sulphur, nitrogen, and carbon. Ecological processes govern primary and secondary production (i.e. energy flow), mineralization of organic matter in the soils and sediments, and storage and transport of minerals and biomass. Efforts to conserve species must therefore also conserve the ecosystems of which they are a part.

Community diversity

Community diversity is a concept of the diversity of the inter-relationships between species within a particular ecosystem (e.g. lime woods, and ash woods, within northern deciduous forest).

Species diversity

Species diversity is a concept of the variety of living organisms on earth, and is measured by the total number of species in the world or in a given area under study (e.g. the total number of world species has been variously estimated as from 5 to 30 million or more, though only about 1.4 million have actually been described), .

Genetic diversity

Genetic diversity is a concept of the variability within a species, as measured by the variation in genes within a particular population, variety, subspecies, or breed (e.g. the chemical units of hereditary information as DNA that can be passed from one generation to another).

In general, the larger the population size of a species, the greater the chance of there being high genetic diversity. But population increase in some species may lead to a population decline in other species, and even to a reduction in species diversity. Since it is usually not possible to have both maximum species diversity and maximum genetic diversity, national policy-makers are trying to define the optimum biological diversity consistent with their objectives for economic development. One key element is to ensure that no species falls below the minimum critical population size at which genetic diversity is lost rapidly.

7.02 Advantages of Conserving Biodiversity

Insurance

There is a considerable uncertainty about the values, including economic values, that future generations may attach to biodiversity. Since our knowledge is so limited, it makes sense to preserve as many species as possible, since we do not yet know which are potentially useful. Biodiversity should be maintained because future practical needs, and values are unpredictable. Our understanding of ecosystems is insufficient to be certain of the impact of removing any component.

Stability

Genetic diversity provides the variability within which a species can adapt to changing conditions. The less diverse environmental systems are less likely to have genetic variability of all kinds available to substitute for others that are depleted. Furthermore, if the effective population size falls below a certain level, the species is likely to die out. Diverse environmental systems normally enhance the resilience to cope with ecological stresses. Many losses are irreversible.

Interdependence of organisms

No organism lives in isolation from other living things and each has its own way of life which contributes to the balance of nature. The inter-dependence and successful functioning of all these parts is a key contributory factor to the stability of the planet as a whole. If we continue to pollute the atmosphere, contaminate land and water, and degrade our ecosystems by, for example, destroying forests, wetlands and marine environments, then the planet will suffer accordingly. The totality of the problem is addressed by a government's sustainable development strategy, but the harmonious and healthy functioning

of all the organisms which constitute "life" is the concern of the Biodiversity Convention, and hence of the national and local biodiversity action plans.

New crops

Genetic variability in cultivated and domestic species is, and probably always will be, an extremely important social and economic resource. It was genetic variability which enabled early peoples to develop the crops and livestock which were a pre-requisite of settled agriculture. The remaining variability is all that is available to enable breeders to develop new varieties. The continued development and stability of agriculture, especially in the longer term, depend to no small extent on our capacity to continue doing this.

Cultural enrichment

We conserve species and habitats because they are beautiful or because they otherwise enrich our lives. The culture of a nation is closely allied to its landscapes and wildlife. A moral argument adds to this perspective the view that we should hand on to the next generation an environment no less rich than the one we ourselves inherited. To support conservation means to act on a belief that a culture which encourages respect for wildlife and landscapes is preferable to one that does not.

7.03 Loss of biodiversity

Biological diversity is not spread evenly across the planet. In general, well-watered lowland tropical terrestrial ecosystems have the greatest diversity, which declines with rainfall and latitude (or elevation). Oceanic islands, or small areas of a restricted habitat on land, tend to have fewer species than large areas of the same habitat type. On the other hand, isolated islands tend to have endemic species which are found nowhere else. Therefore, conserving the entire range of the world's biological wealth requires protecting the endemic species on islands, as well as those in larger areas of higher biodiversity. Increasingly, as more and more ecosystems are destroyed, the diverse seminatural habitats associated with older cultures, (e.g. small fields, wood pasture, and sacred sites) become very valuable as characteristics of the local landscape. They require protection.

Human influences tend to reduce diversity, particularly where they are intensive and long-standing (as in permanent agriculture), but limited human activities can actually increase diversity (as in some tropical village systems of shifting cultivation at low human population densities). Aquatic habitats parallel these generalisations, with the tropical systems—especially coral reefs, and large old lakes (as in the African Rift Valley lakes)—having greater diversity than temperate systems.

Within these broad trends, some areas are more diverse than others. These patches of high biodiversity are due to such factors as:-

- complexity of soils and other geological factors;
- altitudinal variation (areas with considerable variation in elevation containing greater diversity and being better able to adapt to climate change);
- history (some areas having served as "refugia" during drier or cooler periods).

Most diversity tends to be found in extensive tropical habitats which are little affected by humans, so relatively large protected areas are likely to be the most effective way of conserving maximum biological diversity. But the real situation is far more complex than that, because diversity also occurs in managed forests, secondary forests, and agro-ecosystems. Conserving biological resources therefore requires a wide range of management tools, varying from complete protection to intensive management alongside industrial production systems.

7.04 Sustainability

Current processes of economic development are depleting many biological resources at such a rate that they are rendered essentially non-renewable. Experience has shown that too little biological diversity will not be conserved by market forces alone, and that effective government intervention is required to meet the needs of society. Economic inducements are likely to prove the most effective measures for converting over-exploitation to sustainable use of biological resources. An outline of current economic approaches to the conservation of biodiversity is presented in Section 7.

8.0 THE UK BIODIVERSITY ACTION PLAN

- 8.01 History
- 8.02 Importance of Biodiversity
- 8.03 Goal and Objectives
- 8.04 Even Common Species are at Risk
- 8.05 Concerns

8.01 History

Governments signed the Convention on Biological Diversity at Rio de Janeiro. They expressed a shared belief that action must be taken to halt the world-wide loss of animal and plant species and genetic resources. At the same time they agreed to draw up national plans and programmes and help each other to implement them. The United Kingdom Biodiversity Action Plan establishes a framework but whether, in the end, we and our children enjoy a country which is richer or poorer in species and habitats depends on all of us. The harmonious and healthy functioning of all the organisms, common and rare, which constitute "life" is the concern of the Biodiversity Convention, and hence of every local the biodiversity action plan.

8.02 Importance of Biodiversity

1 Biodiversity is the variety of life forms we see around us. It encompasses the whole range of mammals, birds, reptiles, amphibians, fish, insects and other invertebrates, plants, fungi, and micro-organisms such as protists, bacteria and viruses.

2 Article 2 of the Biodiversity Convention defines biological diversity to mean:-

The variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and includes diversity within species, between species, and between ecosystems.

Biodiversity matters because:-

- future practical needs and values are unpredictable and our understanding of ecosystems is insufficient to be certain of the impact of removing any component;
- genetic diversity provides the variability within which a species can adapt to changing conditions.
- the less diverse environmental systems are, the less likely it is that gene pools and reservoirs, indeed genetic variability of all kinds. will be available to substitute for others that are depleted;

- if the effective population size of an organism falls below a certain level. the species is likely to die out;
- diverse environmental systems normally enhance the resilience to cope with ecological stresses: many losses are irreversible;
- there is considerable uncertainty about the values, including economic values, that future generations may attach to biodiversity: our knowledge is so limited, so it makes sense to preserve as many species as possible, as insurance, since we do not yet know which are potentially useful;
- no organism lives in isolation from other living things and each has its own way of life which contributes to the balance of nature. The inter-dependence and successful functioning of all these parts is a key contributory factor to the healthiness of the planet as a whole. If we continue to pollute the atmosphere, contaminate land and water, and degrade our ecosystems by, for example, destroying forests, wetlands and marine environments, then the planet will suffer;
- genetic variability in cultivated and domestic species is, and probably always will be, an extremely important social and economic resource. It was genetic variability which enabled early people to develop the crops and livestock which were a pre-requisite of settled agriculture and which now enable breeders to develop new varieties. The continued development and stability of agriculture, especially in the longer term, depend to no small extent on our capacity to continue doing this;
- the culture of a nation is closely allied to the biodiversity of its landscapes. The moral argument adds to this perspective the view that we should hand on to the next generation an environment no less rich than the one we ourselves inherited. We believe that a culture which encourages respect for wildlife and landscapes is preferable to one that does not. In other words we conserve species and habitats because they are beautiful or because they otherwise enrich our lives.

8.03 Goal and Objectives

The overall goal of the UK Action Plan for Biodiversity is to conserve and enhance biological diversity within the UK and to contribute to the conservation of global biodiversity through all appropriate mechanisms.

Objectives for conserving biodiversity are:-

To conserve and where practicable to enhance:

- a) the overall populations and natural ranges of native species and the quality and range of wildlife habitats and ecosystems;
- b) internationally important and threatened species, habitats and ecosystems;

- c) species, habitats and natural and managed ecosystems that are characteristic of local areas;
- d) the biodiversity of natural and semi-natural habitats where this has been diminished over recent past decades.

To increase public awareness of, and involvement in, conserving biodiversity.

To contribute to the conservation of biodiversity on a European and global scale. In global terms, the UK is not particularly rich in species; for example, only 210 of the 9,881 species of birds in the world breed in the UK. Nevertheless it has a rich and characteristic biological diversity for an island of its size, isolation and geographical position. Many aspects of the UK's biodiversity are linked with biodiversity elsewhere, notably in the case of migratory birds, sea mammals and fish. Several species are dependent on a particular character of landscape or of land management. If these change species can suffer.

8.04 Even Common Species are at Risk

Many bird species typical of lowland farmland such as the grey partridge, barn owl and lapwing have undergone pronounced declines since the mid 1970s. Housemartins and skylarks are not so common as they were 10 years ago. These trends coincided with major changes in agricultural practices in lowland Britain such as the switch from spring to autumn sowing of arable crops and a move away from crop rotations and mixed farming.

An analysis of changes in plant species richness surveyed in 1978 and 1990 was included in the Countryside Survey 90. In 1978 over 1,000 vegetation plots were located at random within a sample of 256 1 km squares representative of Great Britain. The same plots were re-surveyed in 1990. For all plots surveyed in both 1978 and 1990, regardless of whether the plots remained in the same broad habitat type, there were significant losses of species richness in semi-improved grassland (-13%), woodland (-14%) and upland grass mosaics (- 11%). There was a gain in richness in moorland habitats (+7%).

For the plots that remained within the same habitat type in 1978 and 1990 there were significant losses of richness in arable fields (-29%) and woodlands (-20%), and a gain in diversity in moorland habitats (+8%). Between 1984 and 1990, there was a net loss of 23% of hedges (about 130,000km) in Great Britain. The net loss of hedges was the result of a combination of hedge removal and hedge degradation, and it occurred despite the planting/regeneration of about 50,000km of hedges. In addition to the reduction in the extent of this important linear habitat, there is also a loss of quality. Between 1978 and 1990, on average one plant species was lost from each 10 metres of hedge, an 8% loss of plant species richness.

Checking on biodiversity is not just about the rarities. A changes in the abundance of a place weeds may be a local indicator of a more widespread disaster.

8.05 Concerns

1 Our concerns about losses of habitats and species can be grouped into the following categories:-

- the continuing loss and fragmentation of habitats such as chalk grassland, heather moorland, hay meadows and wetlands, as a result of such factors as intensified farming practices, abstraction of water and development and road construction;
- the loss of habitats. linear features such as hedgerows, field margins and ditches, and their associated species resulting from neglect or abandonment, and from the decline of traditional forms of management as they become increasingly uneconomic and difficult to sustain;
- point source or diffuse pollution arising from a variety of sources including effluent from sewerage treatment works and industrial processes, run-off from agricultural chemicals or farm waste and acid deposition as a result of burning fossil fuels.

Any one of these concerns could be the stimulus for a local bioscope. There is also a need for making simple inventories of common wildlife which provide a baseline for checking in future years. Here is an example of the importance of school records. Children in Northamptonshire during the 1950s recorded the Chequered skipper butterfly as 'common in most local woods'. Photographs were taken of it at that time. Now it is extinct in England. The reasons for its disappearance are not known. A rigorous annual survey might have generated alarm and efforts made to conserve it.

9.0 ECONOMICS AND BIODIVERSITY

- 9.01 Management of Biodiversity
- 9.02 Biodiversity as a Public Good
- 9.03 Economic Obstacles
- 9.04 Assessing the Value
- 9.05 Economic Incentives
- 9.06 "Perverse Incentives"
- 9.07 Incentives at Community Level
- 9.08 National Incentives
- 9.09 International Support
- 9.10 Funding Incentives
- 9.11 Guidelines

9.01 Management of Biodiversity

The making of plans to manage biodiversity for the global good is the most important challenge of nature conservation. This section provides a global view of the ways in which management of wildlife could be integrated with the management of human economic development.

Management systems aimed at maintaining ecosystems include:-

- protected areas;
- integrated land-use planning;
- zoning systems, and regulations on permissible activities.

Management systems aimed at sustaining wild species in their natural habitats include:-

- controls on harvesting or trading;
- enhancement of stocking rates;
- and habitat manipulation.

All of these require research and monitoring to ensure that the technologies are effective. In addition, various off-site (ex situ) techniques are available, including: captive breeding or propagation programs in zoos, botanical gardens, hatcheries, and game farms; seed and pollen banks; microbial culture collections; and tissue culture collections. The latter are most suitable for maintaining diversity of agricultural species and varieties.

9.02 Biodiversity as a Public Good

The resources of forests, savannahs, and seas fall into several broad categories. Economists distinguish non-renewable natural resources such as oil, coal, gold, and iron from renewable resources such as forests, animals and grasslands; the renewable

resources are inexhaustible when managed appropriately. Both non-renewable and renewable resources can be privately, communally, or governmentally owned and managed. They are also generally recognised to have market value, although market values do not always reflect their true scarcity or aesthetic value to society.

Much more difficult for economists and resource managers to deal with are environmental resources, which are "public goods" based on the functioning ecosystem; these include such things as the provision of clean air, functioning watersheds, biodiversity, and scenic beauty. While these environmental resources provide valuable services to people, they seldom have market prices assigned to them.

Renewable natural resources and environmental natural resources yielding important public goods characteristics can be considered together as "biological resources," being based on genes, species, and ecosystems which have actual or potential value to people. These biological resources are the physical manifestation of the globe's biodiversity, which simply stated is the variety and variability among living organisms and the ecosystems in which they occur..

As the non-renewable resources are gradually consumed, the renewable biological resources are likely to increase in importance and nations which have maintained their rich endowments of biodiversity may well have a significant advantage over those whose biological resources have been depleted. A fundamental point to bear in mind is that effective systems of management can ensure that biological resources not only survive, but in fact increase while they are being used, thus providing the foundation for sustainable development.

A particular challenge comes from the fact that the areas with the greatest biodiversity are frequently those with the fewest economic means to implement conservation programs. Most of the biologically richest nations have low per capita income. For example, Zaire and Burma have only 1% of the per capita income of the USA and Switzerland).

Within most countries, the greatest biodiversity tends to be found in the most remote regions, where habitats are least affected by modern influences. For these biologically rich but economically poor nations and regions, using their resources to generate income for their (typically increasing) populations has first priority. Problems arise when these resources are abused through mismanagement rather than nurtured through effective management.

Since future consumption depends to a considerable extent on the stock of natural capital, conservation may well be a precondition for economic growth. Conservation is certainly a precondition for sustainable development, which unites the ecological concept of carrying capacity with the economic concepts of growth and development. But instead of conserving the rich resources of forest, wetland, and sea, current processes of development are depleting many biological resources at such a rate and reducing them to such low population levels that they are rendered essentially non-renewable.

Development agencies are becoming concerned about the depletion of these species and ecosystems, with the growing awareness that development depends on their maintenance. The over exploitation of biological resources is providing the major new development challenge of the late 20th Century. How can the process of change be managed so that biological resources can make their best contribution to sustainable development? Which economically attractive land uses are compatible with the conservation of biodiversity? What economic incentives are available to promote conservation instead of over-exploitation?

In seeking answers to such questions, those responsible for planning and implementing the process of sustainable development already have sufficient technology to manage these resources far better than is being done today. Ample guidelines exist for the management of biological resources, but political will has been insufficient to ensure the effective implementation of these guidelines.

The fundamental problem is that more people earn greater immediate benefits from exploiting biological resources than they do from conserving them. To the extent that resource exploitation is governed by the perceived self-interest of various individuals or groups, behaviour affecting maintenance of biodiversity can best be changed by providing new approaches to conservation which alter people's perceptions of what behaviour is in their self-interest.

Since self-interest today is defined primarily in economic terms and conserving biodiversity is part of the process of sustainable development, the decision makers with the appropriate power and resources to influence the development process—statesmen senior civil servants, planners, corporate directors, development assistance agencies, forest-based enterprises, and so on—are most likely to generate enthusiasm for policies which promote conservation through the means of economic inducements.

9.03 Economic Obstacles

Effective environmental management can ensure that biological resources not only survive, but in fact increase while they are being used. This is the foundation for sustainable development, and for stable national economies. Human decision-making is inevitably based on economic thinking, irrespective of whether it is labelled as such. It is therefore important to demonstrate the benefits of linking economics more explicitly with the conservation of biodiversity.

The fundamental constraint is that some people earn immediate benefits from exploiting biological resources without paying the full social and economic costs of resource depletion; instead, these costs (to be paid either now or in the future) are transferred to society as a whole. Further, the nations with the greatest biodiversity are frequently those with the fewest economic means to implement conservation programs. They need to use their biological resources to generate income for their growing populations, but problems arise when these resources are abused through mismanagement rather than nurtured through effective management.

Other major economic obstacles to conservation include:

- biological resources are often not given appropriate prices in the marketplace;
- social benefits of conserving biological resources are often intangible, widely spread, and not fully reflected in market prices. Therefore, the benefits of protecting natural areas are, in practice, seldom fully represented in cost-benefit analysis;
- the species, ecosystems, and ecosystem services which are most over-exploited tend to be the ones with the weakest ownership;
- the discount rates applied by current economic planning tend to encourage depletion of biological resources rather than conservation;
- conventional measures of national income do not recognise the drawing down of the stock of natural capital, and instead consider the depletion of resources, i.e., the loss of wealth, as net income.

9.04 Assessing the Value

In order to compete for the attention of government decision makers, conservation policies first need to demonstrate in economic terms the value of biodiversity to the country's social and economic development. Approaches for determining the value of biological resources include:

- assessing the value of nature's products—such as firewood, fodder, and game meat—that are consumed directly, without passing through a market;
- assessing the value of products which are commercially harvested, such as timber, fish, ivory, and medicinal plants;
- assessing indirect values of ecosystem functions, such as watershed protection, photosynthesis, regulation of climate, and production of soil.

Some biological resources can be easily transformed into revenue through harvesting, while others provide flows of services which do not carry an obvious price-tag. However, an ecosystem which has been depleted of its economically-important species, or a habitat which has been altered to another use, cannot be re-built out of income. The costs of re-establishing forests, or reversing the processes of desertification, can far exceed any economic benefit from over-harvesting, or otherwise abusing biological resources. The environmental costs of depletion need to be estimated in terms of the time and effort required to restore resources to their former productivity.

Assessing values and costs of protecting biological resources provides a basis for determining the total value of any protected area or other system of biological resources. Since the value of managing biological resources can be considerable, conservation should be seen as a form of economic development. Since biological resources have economic values, investments in conservation should be judged in economic terms, requiring reliable and credible means of measuring the benefits of conservation.

9.05 Economic Incentives

Resource exploitation is governed by the perceived self-interest of various individuals or groups. Therefore, conservation behaviour may be encouraged by providing new approaches to conservation which alter people's perceptions of what behaviour is in their self-interest. Since self-interest today is defined primarily in economic terms, conservation needs to be promoted through the means of economic incentives.

An incentive for conservation is any inducement which is specifically intended to incite or motivate governments, local people and international organisations to conserve biodiversity.

A perverse incentive is one which induces behaviour which deplete biodiversity. A disincentive is any inducement or mechanism designed to discourage depleting of biodiversity.

Together incentives and disincentives provide the carrot, and the stick, for motivating behaviour that will conserve biological resources.

Direct incentives—either in cash or in kind—are applied to achieve specific objectives, such as improving management of a protected area. Indirect incentives do not require any direct budgets biological resource conservation, but require integrating into existing policies.

Incentives are used to divert land, capital, and labour towards conserving biological resources, and to promote broader participation in work which will benefit these resources. They can:-

- smooth the uneven distribution of the costs and benefits of conserving biological resources;
- mitigate anticipated negative impacts on local people by regulations controlling exploitation;
- compensate people for any extraordinary losses suffered through such controls, and reward the local people who 'provide' nature for larger public.

Incentives are clearly worthwhile when they stimulate activities which conserve biological resources, at a lower economic cost than that of the economic benefits received.

To function effectively, incentives require some degree of regulation, enforcement, and monitoring. They must be used with considerable sensitivity if they are to attain their objectives, and must be able to adapt to changing conditions.

9.06 "Perverse Incentives"

Economic incentives have had far more effect on overexploiting biological resources than conserving them. In most parts of the tropics, the opening of forest areas is supported by powerful economic incentives, such as state-sponsored road-building programs, which facilitate access to markets. Further, resettlement of poor people in the remote forested areas made accessible by new roads is often politically preferable to genuine land reform, which involves the redistribution of existing agricultural lands. Governments have often instituted these perverse incentives for important political or social reasons, and the impact on the environment is often a side effect.

Incentives to convert forests and other wilderness to agricultural uses were once appropriate when biological resources were plentiful. Now the process is reaching its productive limits (and indeed has exceeded them in many places). A major step in moving from exploitation to sustainable use is for governments to review the impacts of all relevant policies biological resources. Based on the policy review, governments should eliminate or at least reduce policy effects that favour environmentally unsound practices, discriminate against the rural poor, reduce economic efficiency, and waste budgetary resources. Overcoming the damage caused by perverse incentives will require new incentives to promote conservation, applied at a series of levels and in a number of administrative areas.

9.07 Incentives at Community Level

Biological resources vary considerably from place to place, depending on such factors as soil, rainfall, and history of human use. For the people living in or near the forests, plants and animals provide food, medicine, hides, building materials, income, and the source of inspiration; rivers provide transportation, fish, water, and soils; and coral reefs and coastal mangroves provide a permanent source of sustenance and building materials.

Depending on these resources, rural people have often developed their own means of managing a sustainable yield of benefits. Biological resources are often under threat because the responsibility for their management has been removed from the people who live closest to them, and transferred to government agencies located in distant capitals. But the costs of conservation still typically fall on the relatively few rural people who otherwise might have benefited most directly from exploiting these resources. Worse, the rural people who live closest to the areas with greatest biodiversity are often among the most economically disadvantaged—the poorest of the poor.

Under such conditions, the villager is often forced to become a poacher, or to clear national park land to grow a crop. Changing this behaviour requires first examining

government resource management policies to determine how they may stimulate a villager's poaching and encroachment. Economic incentives designed to reverse the effects of these policies may provide the best means of transforming an exploiter into a conservationist.

Appropriate measures may include:-

- assigning at least some management responsibility to local institutions;
- strengthening community-based resource management systems;
- designing pricing policies and tax benefits which will promote conservation of biological resources;
- introducing a variety of property rights and land tenure arrangements.

These measures may serve to rekindle traditional ways and means of managing biological resources which have been weakened in recent years.

Which members of a population have their access to biological resources enhanced and which members have it restricted by government policies is of profound importance in determining whether the resources will make a sustainable contribution to society.

People living in and around the forests, wetlands, and coastal zones, rather than governments, often exercise the real power over the use of the biological resources, so they should be given incentives to manage these resources sustainably at their own cost and for their own benefit.

9.08 National Incentives

The biological resources which support the community are also of considerable interest to the nation and the world. Further, incentives at the local community level are likely to require considerable support from compatible policies at the national level. Biological resources do not occur only in wilderness, and economic incentives may also be used more generally throughout the country to encourage settlement patterns and production systems that are directed at the sustainable use of the resources of forest, savannah, wetland, and sea. The specific policies required at the national level will depend on what is required at the community level to conserve biological resources.

Sustainable development requires co-ordination among a number of policies and levels. This is not as easy as it sounds. Many conservation problems are due to divided responsibility among different organisations, leading to fragmentation, poor co-ordination, conflicting directives, and waste of human and financial resources. This can only be overcome by examining the impact of decisions in one sector on the ability of another sector to depend on the same resources. In most cases, the optimal balance point where the benefit of considering secondary impacts is overtaken by the cost of doing so requires very broad considerations, beyond the current practice of taking the narrow view.

9.09 International Support

Biodiversity is a public good, and species and ecosystems in one part of the world can provide significant benefits to distant nations. Indeed, some experts believe that far greater benefits from conserving native gene pools, especially in the wilds of the tropics, will be gained by wealthy temperate nations than the often poverty-stricken nations doing the conservation. Further, much of the depletion of biodiversity over the past 400 years or so has been caused by powerful global forces, primarily driven by markets in colonial, and then industrial, countries. Because the international community as a whole benefits from conservation, it should contribute to the costs of conserving biological resources.

An important means is through the provision of economic incentives from the temperate nations to the tropical ones. These can include direct incentives such as grants, loans, subsidies, debt swaps, and food; and indirect incentives such as commodities agreements, technical assistance, equipment, and information. Development assistance often contains a package of such incentives, including both direct on-the-ground projects and very abstract incentives such as peer pressure and public image.

9.10 Funding Incentives

Governments seldom have sufficient capital or labour to manage their nation's biological resources in an optimum way. Conservation programs are usually implemented through resource management agencies who need sufficient and reliable sources of support to implement an effective, long-term incentives scheme.

Some incentives involve little more than an administrative decision or regulation, such as the enactment of a law or monetary policy action, while others involve agreements or co-operation with international agencies. In many developing countries, large externally-supported development projects can often include elements which support incentives for conserving biological resources. Community development activities may already be in progress in communities located near areas important for conserving biological resources, in which case conservation can be incorporated with little additional cost.

Additional innovative funding mechanisms for supporting incentives include:-

- tax deductibility for donations of cash, land, or services;
- charging entry fees to protected areas; returning profits from exploiting biological resources to the people living in the region;
- implementing water use charges for the water produced by a protected area;
- building conditions into extractive concession agreements;
- seeking support from international conservation organisations;
- and considering "conservation concessions," similar to those for forestry or mining.

The threats to biological resources have such profound implications for humanity that governments must take decisive action, and accept that some additional investments will be required. But sustainable development of biological resources will likely be far less expensive than rehabilitation programs, and most conservation efforts have proven cost-effective on traditional economic grounds.

9.11 Guidelines

Action is required at the strategic level, where governments establish national and international objectives for addressing on a broad front the fundamental problems of degradation of biological resources.

At the tactical level, specific actions are required to address specific problems.

Guidelines are required to promote the survival of the optimum biodiversity, and to suggest ways and means for ensuring that biological resources make their most useful contribution to sustainable development. The objectives of the guidelines include the following:

- to provide mechanisms by which biological resources can continue to support the process of sustainable development.
- to assist those who are designing, implementing, or evaluating projects which affect biodiversity to incorporate appropriate economic incentives into their projects.
- to provide all agencies concerned with biodiversity— including international organisations, development agencies, government agencies, and non-governmental organisations (NGOs)— with guidelines on how to incorporate economic methods into their efforts to conserve biodiversity.
- to help generate additional funding to supplement dwindling public funds for government and private agencies involved in conservation of biodiversity.
- to stimulate the creation of ways and means by which conservation of biological resources can be essentially self-financing (especially for key protected areas).

Guidelines are intended to provide practical advice for the formulation of policies for the sustainable development of biological resources, and for the conversion of policy into practice through specific project interventions. They cannot provide definitive answers to every situation, because each setting has its own characteristics. Factors which will affect how economic incentives and disincentives are applied in a particular case include:

- the specific nature of the local or national economy;
- the number, size, and influence of factors depleting biological resources;
- the nature of the biological resource and its response to disturbance and exploitation;
- the relative strength of local institutions;
- the technical alternatives available to counteract depletion of biological resources; and
- the authority of the control agency.

10.0 PERSPECTIVES ON ENVIRONMENTAL EDUCATION

Based on quotations from:

'Europa' Nos 3 and 4 (1992-3) Centre for European Education, Lisbon

'Naturopa' No 74 1(994) Centre Naturopa, Council of Europe

'Euro-Link' 1994. A newsletter written by Portuguese, Dutch, English and German children who are members of the European Clubs schools network.

10.1 The Need

10.2 The Goals

10.3 The Difficulties

10.4 The Way Forward

10.5 The International Dimension

10.6 The European Dimension

10.7 Practical Approaches

10.1 The Need

Man has the fundamental right to freedom, equality, and adequate conditions of life, in an **environment** that permits a life of dignity and well-being. UN Conference on the Environment Stockholm 1972

The problem of the **environment** is humanity's number one problem, and **environmental education** must be regarded as a priority. Particular attention should be given here to young people, so that the world's future leaders can learn to manage its affairs better than their elders. Prof. Mario Pavan Chairman International Organising Committee European Nature Conservation Year 1995

The need for a high priority for **environmental education** has arisen because the **environmental debate** has shifted from a focus on single **environmental issues** to a growing realisation that **environment** and economics, or conservation and development, must be viewed together, if either part of the equation is to be sustainable, and if we are to bequeath to our children, and their children, a healthy and resource-rich **environment**". Stephen Stirling England

The need for **environmental education** at the international level was recognised, and its development requested, through Recommendation 96 of the United Nations Conference on the Human **Environment**, Stockholm 1972. This stated that the Secretary General, the Organisations of the UN, particularly the UNESCO and the other international agencies concerned, should, after consultation and agreement, take the necessary steps to establish an international programme in **environmental education**. This should be interdisciplinary in approach, in school and out of school, encompassing all levels of education, and directed towards the general public in particular, the ordinary citizen living in rural and urban areas, youth and

adult alike. It should educate him to the simple steps he might take, within his own means, to manage and control his **environment**. United Nations Conference on the Environment Stockholm 1972

10.2 The Goals

2.1 The Goals of **Environmental Education** are:

- to foster clear awareness of, and concern about, economic, social, political, and **ecological interdependence**, in urban and rural areas;
- to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills, needed to protect and improve the **environment**;
- to create new patterns of behaviour of individuals, groups, and society as a whole, towards the **environment**. UNESCO Conference Tblisi 1977

10.3 The Difficulties

3.1 Teaching today is strongly influenced by (classical) subjects, so by far most of the teaching within a European dimension takes place, and will take place, in subjects. Every increase in knowledge will be incorporated there. Much less will be performed in interdisciplinary teaching.

Nevertheless, the European Dimension itself has a cross-disciplinary character. So the concept asks for a co-ordinated approach across the various subjects in schools curricula, with an impact on teacher training and production of teaching materials. Bernd Janssen Director of the 'Europe at School Co-ordinating Unit' Bonn

3.2 The main difficulties to promoting **environmental education** in schools are:-

- the strict, rigid teaching methods, focusing on knowledge of facts;
- a crowded curriculum;
- approaches to learning that are biased towards science, and not age-appropriate;
- not enough active learning methods;
- too little outside or fieldwork activities;
- very limited activities concerned with improving **environmental awareness** among society;
- financial difficulties faced by many schools;
- inadequate teaching resources for teachers and students.

Slawermir Karwowski Poland

10.4 The Way Forward

4.1 In the last few years the importance of **environmental education** for social change appears to have gained new interest. Policy-makers outside the field of **environment** are starting to realise that real change demands the involvement of the entire **community**, both individuals and groups. The document 'Caring for the Earth'

sums up what it is all about. Values, economies and societies, different from most that prevail today, are needed if we are to care for the Earth and build a better quality of life for all. Peter Bos The Netherlands

4.2 **Environmental education** should focus on areas of nature conservation, remediation, **environmental protection** and resource management. In addition, it must place emphasis on political, economic, technical and human aspects of **environmental protection**, such as ethics, aesthetics, and social issues. This education programme should not look just at theory, but also at how to apply principles, and achieve goals through a problem, and a value orientated, process.

Elizabeth Vajadovich Visy Hungary

10.05 Given the growing **environmental imperative**, the following criteria were seen to constitute a new responsibility for the education system, that is, the promotion of **environmental awareness**, and of dynamic qualities in students, such as initiative, independence, commitment and readiness to accept responsibility. Appropriate school initiatives at all attainment levels should include the following dimensions:-

- personal involvement of students and their emotional commitment;
- interdisciplinary learning and research;
- reflective action to improve **environmental conditions**;
- involvement of students, at least partially, in decision-making or problem-finding, on procedures, and on monitoring their work;
- the concept of **environment** should be broadly defined, not limiting school initiatives to the **natural environment**, but including social, economic, cultural, and technological dimensions between schools and **community**, to links with outside institutes.

K. Kelly-Laine ENSI (The international Environmental and School Initiatives Project) OECD

10.06 In 'Caring for the Earth', the International Union for the Conservation of Nature (IUCN) lists nine principles for sustainable living. All of them have implications for education, because without a means of helping people to understand their importance, and to live sustainably, the principles will remain ideals. Education is particularly important in enabling people to change personal attitudes, and practice through helping people to re-examine their values, and alter their behaviour (Principle 6), and in enabling **communities** to care for their own **environments** (Principle 7), through training, and information dissemination. John Baines IUCN

10.07 believe the following skills and qualities are essential if we are to educate for sustainability

- self-esteem, confidence, motivation;
- co-operation, trust and empathy;
- communication skills, including negotiation and decision-making;
- an ability for critical thinking, lateral thinking and problem-solving;

- self-reliance, an ability to take responsibility for ones own actions;
- future thinking;
- feelings of belonging to the natural world, and an understanding of our relationship to all life on earth;
- creativity, imagination, a spiritual and personal response to the **environment**;
- an ability for reflection and evaluation.

Geoff Cooper England

10.5 The International Dimension

The International **Environmental Education Programme** (IEEP) has developed the holistic concept of **environment** (natural and man-made). It has also examined the philosophy, goals and objectives, guiding principles of **environmental education**, and strategies for their incorporation into the formal and non-formal sectors.

The Programme's major impact in the exchange of information and experience is achieved through its quarterly newsletter 'Connect', published in eight languages, and disseminated to 20,000 institutions and professionals in the world. Similarly the directory of institutions active in **environmental education** promotes interaction among 1,500 institutions in all regions.

The Programme has emphasised **environmental education** with investigation and problem-solving approaches as early in schooling as possible. In this context, the use of the **environment** as a living laboratory is encouraged at all levels of education. This facilitates teaching/learning, and saves funds for classical laboratory set-ups and equipment.

Environmental education, post-Rio, must empower individuals and **communities**, as called for in Agenda 21, for making informed decisions concerning the **environment**, and the sustainable development issues that affect them individually, and collectively, at local, national, and international levels.

A major challenge of **environmental education** is to harmonise the needs and actions of **environmental interventions** with sustainable development priorities. The objectives of industrial and agricultural sectors for sustainability, and the skill potentialities of the business sector, have to match the needs of a decent life-style in the social sector. Much research is needed for revising current policies and guidelines. to meet the challenges of **environmental education** in promoting 'learning to be' in the **environment** which is the only home for the present and future generations of the human family. Dr A Ghafoor Ghaznawi UNESCO

10.6 The European Dimension

6.1 The Treaty on European Union which came into force on 1 November 1993 includes two provisions (Articles 126 and 127, Chapter 3) which enlarge the field of **community action** in the sphere of education and vocational training. The role of the Commission in these fields can be seen as a natural response to the recommendation

that 'member states cooperate, exchange information and compare their experience on issues common to their educational systems'

Learning is most valuable when it relates to our own experience and lifestyles. These learning contexts are the home, **community**, leisure, school, post-school education, and the workplace. K Sankey Scotland UK

10.7 Practical Approaches

10.1 The UN convention on the Rights of Children gives all children the right to speak on their own behalf about their concerns. Whether children are concerned about the **environment**, about their own lack of education, or clean drinking water, about wars between countries, or violence in their own homes, we, the adults, must learn to listen, and to take their experiences, and their ideas seriously. Children are not always right, no more than adults, but they have the right to be heard.

The local process, where the children talk about their own experiences, and the situation in their **community**, is the basis of the 'Voice of the Children' campaigns. The simplicity is the beauty of it: workshops and hearings can be organised in a local school, in a scout troop, in the city hall, or an international conference. The important thing is that many children are involved, and that they are genuinely concerned about the questions they raise. Adults are facilitators only, not to lead the process.

Kristin Eskeland Norway

10.2 Undoubtedly, one of the major missions of the school is to educate European citizens. And that cannot be achieved if the fundamental principles at the root of our society - respect for human rights, for democracy, for difference, tolerance, solidarity etc. are not only taught but experienced by living them.

That is why the European Clubs were set up in Portuguese schools. They are the main instrument to dynamise the programme "European Dimension in Education" designed in 1988/9 to associate actions of the Centre for European Education with those of the Ministry of Education.

The fundamental aim of this Portuguese programme is educating for Europe, looking forward to Europe in a world context, creating a true 'European awareness' in the whole school **community**.

Special emphasis is given to putting into practice measures envisaged in the Resolutions and Recommendations on European Dimension in Education both from the European **Community** and the Council of Europe.

The development of the above mentioned programme involves among others, the following procedures. We have to:

- co-ordinate efforts and actions of the government organisations with the non-government organisations with similar objectives;
- create a minimum structure in the schools: the European Clubs;

- train teachers who will act as multipliers in their respective schools;
- produce suitable teaching materials;
- mobilise teachers, pupils/students, authorities, parents, local **community** etc.;
- organise and support activities with the same aim of enhancing the European Dimension in education such as 'Europe at School'- European School's Day Competition' which every year reaches thousands of pupils and teachers in Portugal and has a really huge impact.

The European Clubs are centres set up by teachers and pupils, free to plan their own activities designed to enhance the European Dimension in education within the general conception. Margarida Belard National Co-ordinator of the Programme European Dimension in Education. Lisbon

10.03 I teach German and English in a High School where a European Club was formed three years ago. We try to make students conscious of their roles in the society they belong to. They are grouped according to their interests and their age. They study, they visit institutions, they invite experts to school, they organise exhibitions, they play, they sing, they cook.

Every year a plan is presented, always covering the three areas.

1 The place where they live

Problems, their detection and proposals for solution

Social

Environmental

Economic

- Yesterday. Today. And tomorrow?
- The school and the **community**
- Ways to active life.
- Awareness of their social roles as inhabitants and members of a **community**

2 The countries of the EC

- Information from Embassies
- Invitations to school
- Contact with foreign schools in Portugal
- National days
- Relationships with others within the Council of Europe, UN, Lome Convention.
- Contacts/debates/workshops with experts and members of Portuguese and European Parliaments.
- Exhibition of materials
- Reception of colleagues and teachers from abroad.

3 The democratic institutions

- From the City Hall to the European Institutions
- Organisations and Treaties

Manuela Martins European Club Escola Secundaria Quelez Portugal

10.04 To exploit the European Dimension we, the teachers, have to produce some changes in our classroom methodology. We also have our European Club. Its a second step, a second living/working space. This club is a centre designed to dynamize activities concerning European Education and our students have joined it either as 'effective members' or friends. There are lots of students and teachers who keep on working on Europe for pleasure. They fulfil several tasks: They collect documentation and update information on the European institutions and countries and after checking information on books, booklets and magazines, they make their own wallcharts, files, crosswords, and journals: they play games on European subjects; they play cards and build puzzles; they organise cultural activities, competitions and exhibitions for the purpose of improving their knowledge of European realities; they watch videos and films on Europe lent by EC institutions and embassies.

We can't imagine a way for the youngsters to while away their leisure time at school better than working in small groups in the European Club.

Our attainment targets have to do with the desire of reinforcing among the young generations a true European spirit. By acting jointly in a spirit of solidarity we want to take part in the building of a high-quality Europe.

Margarida Guimaraes Co-ordinator of the European Club of Escola Preparatoria de Caxias Portugal.

10.05 The general objectives of the European Club of Glazed Tiles are:

- to create among their members a truly 'European spirit' to be spread by all possible means among the **local community** to which they belong and among other pupils, students and teachers in Europe;
- to imbue pupils and young people with a sense of responsibility as European citizens especially with regard to the safeguard of the cultural heritage:

- Promoting exchanges between teachers and pupils by organising exhibitions on My country- the place where I live- Europe (drawings paintings and photographs accompanied by an historical/artistic review.
- Circulating details in Europe of the history and the techniques of glazed tiles.
- Setting up a national and international network of European Clubs interested in this subject.
- Drawing parents and members of the **local community** to the school by involving them in a highly concrete activity and focusing their attention on the European area and consequently, the interesting problems facing Europe today.

Preparatory and Secondary School "Andre de Resende" Evora Portugal

10.06 My name is Guido di Blasi and I am a foreigner who has spent all his life in Germany. I was born in Bonn and I am going to August-Macke-Schule. In my life I've met a lot of German and other foreign children. There have never been any problems about my nationality.

My father is an Italian and my mother was born in Czechoslovakia. I am Italian. It is sad to see that Germany has such a bad reputation concerning the racism. But there is racism all over the world. In my opinion in Germany and especially in Bonn there are many multicultural meetings. At these occasions thousands of people come together and have big parties. Almost a third of these people are foreigners, but all the people get along without any problem. Germany tries to support understanding between Germans and foreigners. Especially in our school -August-Macke-Schule- there are many activities in favour of a better understanding of different cultures e.g. the European Club established by our teacher Mrs Mehle. We have built up also different relationships with other countries at our school. For example, with Namibia (Africa) and Italy. What I want to say is that Germany is a country that does accept foreigners and strangers because it has learned from its history.

Guido di Blasi -August-Macke-Schule

10.07 What is Q-Basic?

So I learned the keywords and especially the way to programme by looking at the examples in the books.

I just put the keyword in connected it with others and waited what would happen. Then I tried a lot of other things until I got little programs. I think this is the best way to learn it.

Its important that you are patient because it never works like you want it. You should also have some mathematical knowledge because it is needed from time to time.

May be that someone got interested in programming now, because it is fun and has a big future. Peter Woiteck (14) Kooperative Gesamtschule Erfurt

10.08 On 9 May 1994 a group of 24 Dutch pupils from Kiemveld school, Den Dungen, joined us for the weekend. Together with our friends from Dynamix we planned a special co-operative day with the emphasis on European partnership. The aims of the day were as follows.

- 1 to integrate Dutch and English children
- 2 to experience a valuable process with a visible end result
- 3 to have a new and exciting experience learning new skills together -Circus-Puppets-Carnival.
- 4 to make all activities safe.

The teachers also had to co-operate and learn new skills. Mr Korsten had to stand in the middle of the club jugglers and have a pencil knocked out of his mouth by the clubs! Mr Lee had to learn how to walk barefoot across a

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path of broken glass. I think he was allowed to practice during the lunch time so that when he did it he didn't hurt his feet. Ben, Heidi, James, Tracey, James, and Laura (all 11 years of age) Portishead Primary School Bristol

10.09 We celebrated Europe Day on Monday May 9th. We had a display of paintings and pictures from all our friends in our Eurobus schools.- Northern Ireland, England, Portugal, Cyprus and Finland and from our friends in the Czech Republic. In the afternoon our Mums and Dads came to join in the fun. Our class had a quiz which was so hard no-one got all the answers right! Some children did folk dancing, while the Nursery Class learned 'Twinkle Twinkle Little Star' in Finnish. In Class 2 the Mums and Dads painted pictures of the children for our art exhibition.

Some of the Mums made Welsh cakes and scones in the staff-room for visitors. Class 3 had passports in their class and everyone had to pass passport control. We listened to music and songs from all the other countries, and we finished off the day with a laugh, watching the teachers do folk dancing! We all had a lovely day and look forward to Europe Day next year. Class 6 Blaengwawr Primary School Wales.

Our European Club is a place of fun where the students usually meet to learn more about Europe. Each member can choose his/her activity, playing and producing games about Europe, writing leaflets or letters to other European schools, reading and writing stories based on Portuguese tales and legends, painting wall charts, getting information to use on different activities, watching videos, singing and learning how to be European.....And participating in the Euro-Link of course!

Sometimes our Club receives European visitors and it is very funny to meet other people and speak English or French! And every year we make the arrangements and prepare a great feast to celebrate Europe!

Pedro Picarra Jose Maria M Ferreira 6B Club Europe esc. prep. de Caxais Portugal