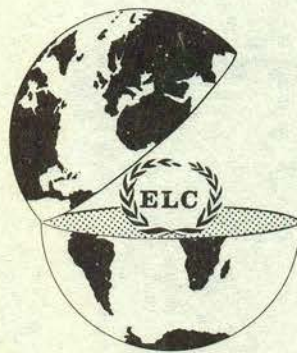


**Report on
Non-Government Organization Activities
on Environmental Issues Related
to UNEP Programmes**



**Prepared for the
Seventh Governing Council of the
United Nations Environment Programme**

March, 1979

Environment Liaison Centre

Nairobi, Kenya

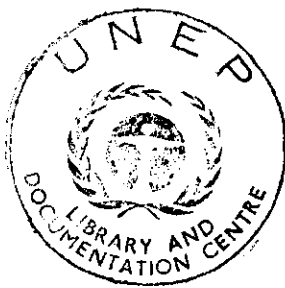
REPORT ON

NON-GOVERNMENTAL ORGANIZATION ACTIVITIES
ON ENVIRONMENTAL ISSUES RELATED
TO UNEP PROGRAMMES

PREPARED FOR THE
SEVENTH GOVERNING COUNCIL
OF THE UNITED NATIONS ENVIRONMENT PROGRAMME

MARCH, 1979

THE ENVIRONMENT LIAISON CENTRE
NAIROBI, KENYA



foreword

Once again the United Nations Environment Programme has co-operated with the Environment Liaison Centre (ELC) in the survey of NGO activities in subject areas to be reviewed in-depth by the Governing Council of UNEP at its seventh session (April/May 1979) and in the production of this report on the findings of the survey. We believe that the information contained in the report will be valuable to Governments during and after the Governing Council and to others interested in the work of the NGO community to which UNEP attaches great importance.

The success of a survey of this kind depends on the willingness of the NGOs to co-operate with the ELC and constitutes a concrete example of their commitment to the cause. I therefore wish to express our appreciation to the many NGOs that exerted themselves to respond to the enquiries of the ELC during 1978, and thus made possible the compilation of this report which provides supplementary information to that in the report of the Executive Director in the environment programme during the seventh session of the UNEP Governing Council.

Although collected with the support of UNEP the views expressed in this report are not necessarily those of UNEP.

Mostafa K. Tolba
Executive Director,
United Nations Environment
Programme (UNEP)
Nairobi, Kenya.

8 March, 1979

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introduction

This document presents an overview of NGO activities in the seven subject areas selected for in-depth review at the seventh session of the United Nations Environment Programme's Governing Council. It illustrates both the diversity and the intensity of NGO programmes, confirming the constructive contribution they make towards environment and development.

The report is intended to provide information on NGO activities as well as to serve as a directory to a sample of NGOs working in each subject area. NGOs which work in several of the subject areas may not appear in each of the relevant chapters, however, when they do appear an attempt has been made to mention their involvement in the other subject areas to prevent the need for repetition of information in each chapter.

The contents of this report are based upon a survey which included the following elements:

The Survey of NGO activities was undertaken by the Environment Liaison Centre (ELC), Nairobi, Kenya, at the request of UNEP as part of UNEP's preparations of the programme document for the seventh session of the Governing Council.

- Questionnaire: A detailed questionnaire, requesting information on the seven subject areas to be treated in-depth by GC VII, was sent to nearly 5,000 NGOs. The mailing list was prepared from all addresses held by the ELC both on the computer file and from other sources. The information provided from the survey served the dual purpose of up-dating and validating the computer files on NGOs held by the ELC and providing information for this report.

- ELC files: The ELC is in routine contact with a large number of NGOs, and therefore in regular receipt of current information which it uses to correct and update its files.

- IRS: An IRS search produced names of additional NGOs in the relevant fields.

- Directories: The ELC maintains a library of directories listing inter alia environmental NGOs. These were extensively used.

- Other: Key NGOs in the seven subject areas were requested to pass comments and other NGO addresses to the ELC for the survey and UNEP personnel supplied comments and advice on the chapter drafts.

The limitations

Every effort has been made to ensure that the information contained in the report is accurate. However, readers should bear in mind the following limitations to the survey:

- All information has been supplied by the NGOs themselves. This ensured factual accuracy, but also introduces a subjective element in any evaluation of the NGOs' successes (and failures). The vast majority of information in this document is current. In a limited number of cases, however, it may be somewhat dated as information from previous surveys was used when NGOs did not reply to

the latest survey.

- The NGOs covered in this report are examples only, representing just a few of the many NGOs involved in these areas. It is recognised that there are many others which could have been cited as well. For brevity and readability, however, we chose to cite only a few. Furthermore, the NGOs cited are not necessarily the most significant in their field. The examples are intended instead to illustrate the range of NGO activity.

- In this report an attempt has been made to give the widest coverage possible to local and national NGOs. This is not meant in any way to undervalue the work of international NGOs, but more is known of their work and often very little is known internationally of the work of NGOs in local areas.

NGOs Non-Governmental Organisations

The determination of whether or not a given organisation is an "NGO" was difficult. For purposes of this paper, an organisation that is not directly controlled by any government or any intergovernmental body has been defined as an NGO. In particular, this implies that government financing of an organisation does not eliminate its consideration as an NGO - unless the financing implies governmental control.

Organisations which were known to be commercial were not considered in this document, however it was not always clear whether they were non-profit organisations.

The number following the NGO names in each chapter is to aid those reading the french and spanish translations to find the NGO addresses in the address list, as the addresses are arranged alphabetically according to english language NGO names and their countries.

The Environment Liaison Centre

The Environment Liaison Centre was first conceived in 1972, at the U.N. Conference on the Human Environment by participating NGOs concerned with the environment as a means by which they could liaise with UNEP. The Centre was established in 1974 in Nairobi and represents more than 112 non-governmental organisations from around the world of which half are from developing countries. In total, the Centre represents more than 1,500,000 people.

The Centre's purpose is to establish a working relationship with UNEP on behalf of NGOs and to assist communications among NGOs in the developing and the developed countries.

The ELC has undertaken three surveys, two World Environment Day programmes and an environmental education programme with partial funding from UNEP.

For further information

Enquiries can be made to the Environment Liaison

Centre, P.O. Box 72461, Nairobi, Kenya.
Telephone: Nairobi 24770.

Comments

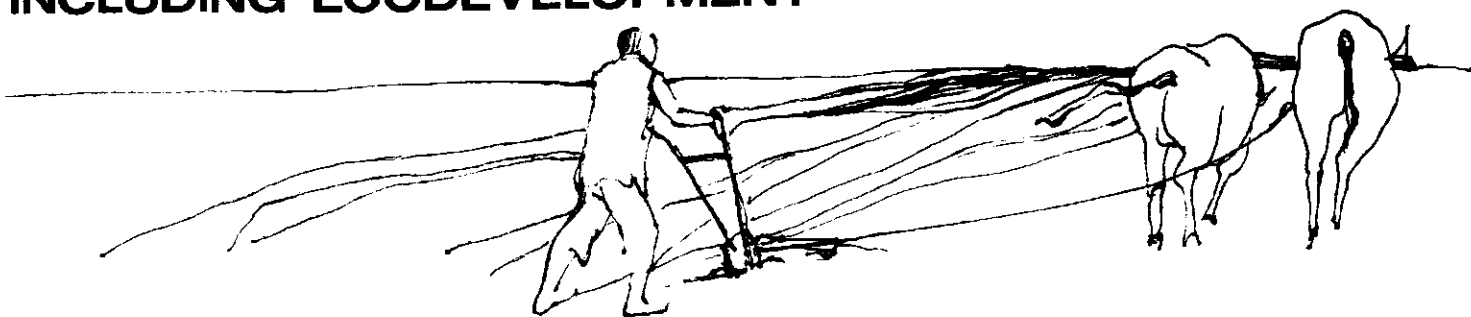
The ELC would welcome suggestions, further NGO information and comments related to making the information in this report of more use to governments and NGOs.

Acknowledgements

This document was written and researched by Serena Zwangobani and Patricia Bifani of the Environment Liaison Centre. Research assistance was provided by Elizabeth Odhiambo and Rhonnie Semakula, and Artwork and other assistance, Kat Honoré. Translation and typing assistance were provided by Anne Brannan. The ELC acknowledges with gratitude the assistance supplied by many others - in particular, the 660 NGOs who gave their valuable time to reply to the questionnaire, to various UNEP personnel associated with the project, and to the key punchers and other personnel who completed the update and validation of the computer files. The views expressed herein are those of the Environment Liaison Centre and ultimately of the authors. They do not represent the views of UNEP.

ENVIRONMENT and DEVELOPMENT INCLUDING ECODEVELOPMENT

ONE



The survey of NGOs which was carried out in order to write this report produced information on NGO activities in all seven fields selected for in-depth review at GC VII, which are:-

- Human Settlements
- Environment and Development, including eco-development
- Use of Natural Resources
- Environmentally sound and appropriate Technology
- Industry and the Environment
- Energy
- Natural Disasters.

In analysing the information, it became clear that environment and development is not usually separate from the other topics treated in this report. Environment and development is a broad concept which encompasses all the topics. Many NGOs concerned with the environment are beginning to undertake activities which correspond with Goal 10 in UNEP's Goals for 1982. They are directing their activities towards the adoption (locally, nationally or internationally) of 'patterns of development and life styles which are consistent with the satisfaction of basic human needs for present and future generations without serious environmental degradation'. This includes activities directed towards building a sustainable world, and in doing this, whatever the concentration of their activities (energy, human settlements, industry, etc.) they are involved in environment and development activities.

One of the recent papers of the *Worldwatch Institute* (0496), Washington, DC, U.S.A., gives an indication of the ideal sustainable world towards which NGOs are working where there would be a balanced relationship between man and his environment. "What would a sustainable world look like? Material well-being would almost certainly be indexed by the quality of the existing inventory of goods, rather than by the rate of physical turnover. Planned obsolescence would be eliminated. Excessive consumption and waste would become causes for embarrassment, rather than symbols of prestige.

The environment would be enhanced, and global population would be balanced with the planet's carrying capacity. All people would have a means of livelihood that yielded fair wages and did not deprive them of health or pride. The inflationary impact of raw materials prices would be diminished, as resource scarcity was mitigated by the widespread use of durable products that could be recycled. Industries and energy sources would be decentralized and hence less vulnerable to acts of man and nature. Both ends of the material chain - the mine and the dump - would fade in importance compared with the improvement of the human condition from existing material stocks. Society would, at long last, apply its collective intellect and energy to the central task of an intelligent materials policy: making the most of what we already have." (Denis Hayes. 'Repairs, Reuse, Recycling - First Steps Towards a Sustainable Society.' *Worldwatch* Paper 23, September 1978.)

Among NGOs, in both developed and developing countries, there is a recognition of the relationship between man's development activities and their

effect on the environment. In both regions, NGOs are concerned with basic needs, although the different patterns of development result in differences both in sources of destruction to the environment and in different approaches to providing for basic needs. In a developed country, NGOs may be working to change agricultural development patterns from monocultured cash crops which require large amounts of energy and chemical pesticides, herbicides and fertilizers; to more use of land for organic subsistence farming with a variety of food crops and limited use of chemicals. In contrast, a developing country NGO may be involved in improving agricultural techniques and equipment for production of larger quantities and greater varieties of food crops and cash crops to meet the need for both food and additional income.

In the case of developed countries, the traditional development patterns are degrading the environment mainly through resource exploitation, the way technology has been used and the way consumption has been promoted. In such areas, NGOs are concerned with researching better options and protective measures, and finding alternative development patterns with changed life-styles.

To quote the President of the *Battelle Memorial Institute* (0433), Columbus, U.S.A., "One of the dominant features of (the) first industrial revolution ... is that it was based and economically optimized on the concept that many things were free or essentially free. That is, we had free air, free water, free - or almost free - energy and land. We were free to make noise and to blight the landscape. Not only did we optimize our industrial system on these concepts - we developed our whole technology, and trained our management, engineers, scientists, and economists to think in these terms. It is only in the past decade that we have come to realize that in the further evolution of use of planet earth, nothing is free ... In the coming second industrial revolution, which we are just now entering, business enterprises will have to live by and economically optimize on the ground rules of the new game. And governments, in all their functions and services, will be bound by the same rules as well. The situation calls for dramatic change - even the way we think has to be revised ... The emergence of the 'age of conservation' may be expected to make obsolete presently established processes in our time." (Battelle Memorial Institute. The President's Report and Annual Review 1977.)

Environment and development problems in developing countries, as dealt with by NGOs, may result from poverty coupled with very harsh physical and environmental conditions. A related cause of these problems is the pattern of development where there is a domination-dependence relationship between the so-called 'central' and 'peripheral' countries determining the exploitation of natural resources to suit the needs of the central country - the central countries usually corresponding to the developed and peripheral to developing countries.

Environmental deterioration due to development activities is now also significant. In these cases NGOs are fostering development programmes which include the innovation of new technologies and actions aimed at meeting the basic human needs of people without environmental destruction. There are also NGOs supporting the call for a New International Economic Order as a basic means for balancing resource distribution and use, and reducing the pollution of poverty.

An analysis of the information provided by about 2000 NGOs shows certain characteristics of an integrated approach to environment and development reoccurring. Although only a small proportion of NGOs (mainly those concerned with rural development, energy and appropriate technology) are sensitive to all the characteristics mentioned below, every NGO mentioned in this report would bear at least some of these characteristics in their activities.

An integrated approach to environment as it relates to development, whether in developing or developed countries, includes: integration, soundness, appropriate growth, appreciation of global interrelationships, community self-reliance and use of scientific and technical knowledge.

- **Integration:** the development process should integrate economic, political, socio-cultural and environmental aspects. Integration is particularly obvious among NGOs working at a local level in developing countries, although the political dimension of their activities (e.g. lobbying, submissions to governments, suggestions for legislation) is frequently minimal. While among developed country NGOs it forms a much more important part of their activities. In a booklet produced by the *National Audubon Society* (0470), New York, U.S.A., as a contribution to the UN Water Conference in 1977, Philip W. Quigg indicates in some detail the complex problems in getting water to the people who need it and the necessity of integrating various kinds of activities. He writes "The goal of pure water for everyone, 'if possible by 1990', will require still higher investment and a much accelerated schedule in rural areas. What makes the task so formidable is that providing clean water will mean little without efficient sewerage disposal and environmental sanitation. This involves education as much as engineering. (Philip W. Quigg. 'Water: the essential resource' National Audubon Society, International Series Number Two. 1976.)

- **Soundness:** economically sound development implies an improvement in the quality of life or the standard of living, while in politically sound development the participants in the development process have some degree of control over such aspects as exploitation of natural resources, information, technology, and selection for employment. Soundness, in a socio-cultural sense, implies consideration is taken of local values, traditions and societal goals as perceived by the participants. Environmental soundness requires considering the maintenance of the ecological balance, minimizing the environmental disruption in the short and long term, and promoting rationality in the use of the earth's resources.

The activities of the African NGO *Enda* (*The Environment Training Programme*) (0329), Dakar, Senegal, are characteristic of an ecodevelopment approach. The example below, of their policy towards technological development, illustrates soundness in this approach. They are interested in technologies which:

- Employ low cost procedures, machines and tools (preferably locally produced), and allow more control by the population; this aims at encouraging management of economic activities by the community;
- Increase the productive capacity of the community in order to satisfy the basic needs of the population in priority, and to diminish the

most arduous and unproductive tasks so as to allow more productive work and cultural activities;

- Use a maximum of local materials and renewable resources - existing or to be produced - and ensure their processing so as to retain a higher percentage of the added value in the community, thus allowing other projects to be started and social services to be improved;
- Are labour intensive: an essential aim being to ensure local employment;
- Are easily copied by other communities without massive assistance from outside sources;
- Encourage and improve endogenous technologies, particular handicrafts, cottage industries and food technologies, but also agricultural and pastoral systems, health care, media, etc.
- Employ renewable sources of energy (animal, wind, sun, biogas ...)"
- **Appropriate growth:** Although the terms 'developed' and 'developing' countries are widely used they imply that at some stage the process of development is completed. Rather than emphasising the possibility of completion, NGOs concentrate on the dynamic nature of development. This characteristic implies a particular type of growth, dynamic but controlled in its aims. Growth in the understanding of humans and their needs, growth in provision of services for all, education and general social well-being. This dynamic development process may actually cut down on some of the more traditional kinds of growth such as in energy consumption, and economic growth so that consumption is reduced or stabilized and natural resource exploitation diminished. Such development encourages efficiency and allows less waste. An illustration of one NGO's approach to appropriate growth is given in the words of the *Conservation Council of Ontario* (0072), Canada: "The world is not static, and change is inevitable. It is the rate of change today which is so potentially disastrous. We cannot turn the clock back and we really do not wish to do so, but we must bring these rapid and sweeping changes under control. We are living in a highly complex world and the answers we will find will entail difficult choices, and they will cost money. Conservation is a matter of intelligent choices which will benefit mankind's own long-term interests and be in harmony with his environment. But we must choose, and we cannot; afford not to pay the cost. Economic yardsticks can no longer be the major criterion in our decisions."
- **Appreciation of global interrelationships:** Most NGOs deal with environment and development challenges on a larger scale than just making their members aware of the need for change in their own life-styles. Even those NGOs who attempt experiments in communal living, cut off from the general development trends around them, still attempt to inform and influence others.

At the international level there is an increasing interest among NGOs with similar environmental interests to work together and with governments. Examples of international networks involving some key NGOs are as follows: saving marine mammals (e.g. *Marine Action Centre* (0468), Cambridge, U.K.); appropriate technology (there are so many organisations, examples will be found in the chapter on this topic); use of solar energy and other soft energy options (e.g. *Friends of the Earth - International Project for Soft Energy Paths* (0455), San Francisco, U.S.A.); organic

farming (e.g. the *Soil Association* (0417), Stowmarket U.K.); wildlife protection and conservation (e.g. the *International Union for the Conservation of Nature and Natural Resources* (0355), Morges, Switzerland).

- **Community self-reliance:** The involvement here varies with developing and developed country NGOs. In developing countries, self-reliance is often seen as the only way to improve the quality of life where there is little finance, modern scientific knowledge, technology, etc. In this case, it implies utilizing their environment by perhaps growing a greater variety of foods, damming water, using local resources for building, practising primary health care, etc. In developed countries self-reliance arises more from a perceived need for defence of the community against the harmful results of industrialised living. For example, there may be concern over the chemical additives in food, pesticides and herbicides used by farmers in food production, technology which uses more energy and resources than necessary, industrial processes which pollute the water and air. Attempts to meet such problems may include setting aside more urban land for food production, organic farming, development of technologies which make greater use of renewable natural resources and renewable sources of energy, changes in consumption patterns.

- **Use of scientific and technical knowledge:** In developing countries, scientific and technical knowledge frequently remain clustered in government and academic institutions making it hard for a mutual exchange of information between them and people outside their immediate spheres of influence. Often science and technology are imported into developing countries for use under entirely different cultural, social and environmental conditions. This transfer is often inappropriate to the new environment.

"Increasingly, students of the political economy of science and technology for development have concluded that much of the formal structure for science and technology, built up so laboriously over the past quarter of a century in poor countries, is at best marginally useful, if not actually harmful, in realizing the goals of development, if it is defined to include both growth and equity. But if formal science and technology systems in developing countries seem only marginally relevant, the flow of technology from industrialized countries appears to have had even less utility in helping developing countries cope with the task of meeting the needs of large numbers, in some cases a majority, of their peoples. An interrelated set of capacities - the creation, acquisition, adaptation and use of technology - lies at the heart of the process of autonomous development. A "technology system" thus defined must be integrated into a society's economic, social, and political institutions, values, and goals. It cannot stand apart from the social order, incompatible with it. Least of all can it be imposed externally. Those developing countries which have moved farthest along this path of generating growth with equity and of meeting the basic needs of most of their peoples have one quality in common - an increasing autonomous capacity to fashion technological solutions appropriate to their economic and social conditions." (Morehouse, Ward, 'Science, Technology, and The Global Equity Crisis: New Directions for United States Policy.' *The Stanley Foundation* (0487) Occasional Paper 16, May 1978),

In this connection, NGOs are providing education and information, to help meet community needs, and using local knowledge and skills related to modern scientific and technical knowledge to produce innovative approaches to community problems. This approach is emphasised particularly in the fields of technology, energy and human settlements.

There are NGOs concerned with particular instances of the transfer of inappropriate technologies to developing countries, especially where such technologies cause environmental destruction.

In developed countries, scientific and technical knowledge appropriate to local conditions is usually available to NGOs, the problem here is more to use this knowledge to show the detrimental effects of development and to devise alternatives. For example, although a population may be aware of the pollution in their air they may not know of the specific risks to their health, the possible ways of preventing the pollution, the costs and technical equipment needed, etc. In such an instance local NGOs can really help in supplying information to the community.

It is within the framework of the above characteristics that we have mentioned NGOs in this report. Indicated below are the general trends of NGO activities in environment and development. There are examples of NGOs which illustrate these general trends in each of the following chapters.

General Trends in NGO Activities - Developed Countries

A. Management of Natural Resources

A great proportion of NGOs are concerned with this. Their interest ranges from conserving natural resources to replacing the use of non-renewable with renewable natural resources. Recycling and reusing of natural resources falls somewhere between the two.

Related to this are often other important concerns such as limits on population growth to curb use of natural resources, measures to reduce energy consumption, discouragement of consumerism, preservation of wilderness areas, and protection of endangered species of plants and animals.

B. Energy Conservation

NGOs particularly concerned with energy conservation encourage a saving in household, industrial and transport energy, and a change in values and life-styles. Some do not go as far as to suggest such radical changes but they may, for example, encourage better house insulation and the use of solar energy for some household needs.

Energy oriented NGOs are often concerned with developing global energy strategies, finding renewable sources of energy, developing energy technology, preventing the use of nuclear energy and changing from a consumer to a consumer ethic.

C. Development of Appropriate Technology

The concern here is to find and use technologies which waste little energy and resources, pollute to a minimum, serve the interests of the majority of the people and can be controlled by the users. The search to replace energy generated from non-renewable resources has been a particularly stimulating one for appropriate technology, designs for technology using wind or solar energy and improvements in housing designs are but two examples.

There are a number of development-assistance NGOs which specialise in appropriate technology for developing countries. This is a partic-

ularly challenging area as the transfer of appropriate technology to the users is still a relatively new field. The most success in this field tends to be when local NGOs develop the technology with the users and at their request, leaving it to the latter to be the main agents in transferring the technologies more widely.

Although much of the movement to develop appropriate technologies involves an attempt to simplify life-styles there is another side to it related to industry. A number of NGOs are involved in researching and utilising highly sophisticated technologies which can be used to treat industrial wastes, to reduce and monitor pollution, convert wastes into useable materials, recycle water from industrial processes, etc. Such NGOs are usually scientific research institutes which make no value judgements about the cause of the problems but are purely interested in finding ways to overcome them or, at the most, produce policy options for development possibilities.

D. Alternative life-styles

Each of the above trends, taken to their logical conclusion, require a move towards an integrated approach to environment and development with alternative life-styles to those currently prevalent. This interest is manifested in the NGO attempts to preserve wilderness areas, farm organically, cycle rather than use petrol-driven transport, devise systems to use municipal wastes and sewerage, change eating habits to waste less and be more nutritious, change consumer values to waste less energy and resources, and innovate technologies and new uses of resources which are not harmful to the environment. The concept of development which centred on maximising accumulation, fixed investment, growth of output and modernisation has altered among NGOs to centre on meeting basic needs both for the individual and the community.

General Trends in NGO Activities - Developing

Countries

A. Fulfillment of basic needs

NGOs are involved in community fulfillment of basic needs such as improving farming techniques to provide more food, supplying potable water, using alternative energy sources such as bio-gas and solar energy, providing homes, schools, etc.

B. Income generation

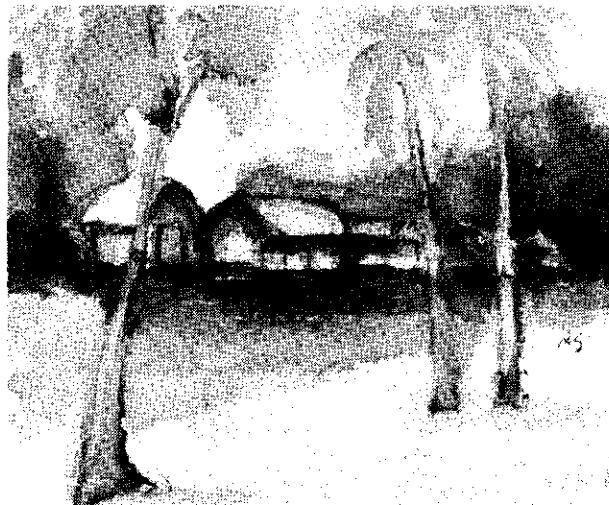
Most NGOs and the communities they work with seek to further improve the quality of their existence by the use of such inputs as tools, improved varieties of seeds and animals, medicines, educational facilities, etc. To support such inputs, NGOs include income-generating activities as part of their programmes. These activities may include handicrafts, cash cropping, selling surplus food crops, processing locally-grown food (e.g. shelling and cooking groundnuts, drying fish), raising poultry for slaughter and sale, collecting community waste materials and recycling them for sale, training skilled artisans who provide their services for a fee.

C. Community-centred development

Usually an NGO will concentrate on improving conditions in a small area - a village or group of villages. They are likely to try first to meet the needs expressed by the community as most immediate. This may require that they work on a series of integrated tasks at once, such as a

programme for a child-care centre, making a well for water and building latrines.

Community development programmes usually include an element of community self-reliance. Examination is made of the local environment to see what improvements can be brought about without going further afield. For example, self-sufficiency in food may be possible if



an irregular water supply is dammed and used for irrigation; housing may be able to be improved if the technique and equipment for brick-making is introduced and local materials utilised; the protein needs of the community may be adequately met if poultry farming is used to supplement other protein sources.

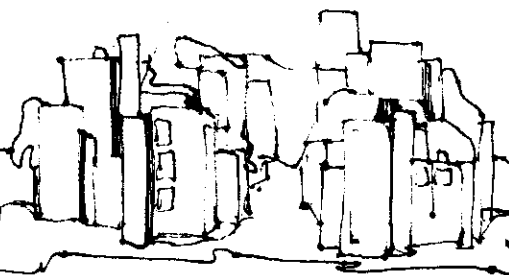
D. Rural development

Most development oriented NGOs are working in rural areas, frequently in agriculture and/or small scale industry. In agriculture, traditional methods may still be encouraged but supplemented with scientific knowledge. In small scale industries, local skills which have fallen into disuse may be revitalised; innovative ways of producing local products may be introduced to meet new market demands; training in such activities as mechanics, building, carpentry, book-keeping, sewing and weaving, may be provided.

E. Education, Information and Training

Few developing country NGOs are involved solely in education, information or training activities, but the vast majority of them provide these kinds of activities in relation to provision of basic needs or income generation, especially.

The education is likely to be non-formal, designed around the particular needs of a group of farmers or women, for example. Information may be provided by personal contact, newsletter, or radio programmes. Training in handicrafts, carpentry, cooking are just some examples of meeting a need to generate income by carrying out practical tasks.



1.1 GENERAL STATEMENT

Human Settlements is a field of particular interest for NGOs. Their activities cover a wide range of concerns, related to the requirements of the present pattern of development. Thus developed countries tend to concentrate on energy issues and urban problems, derived from an over-industrialised life-style, while in the developing countries, when they focus on human settlements they do so in the context of the development process.

General NGO activities in this field are related to some of the following:

- . Energy considerations in urban planning and architectural design. The introduction of solar devices and the utilisation of non-conventional sources of energy; recycling systems and even the construction of autonomous villages in relation to energy supply, are activities which are widespread amongst NGOs throughout the world.

- . Another aspect widely considered by NGOs is planning, mainly physical, urban, rural and regional, emphasising land-use, proper utilisation of space and resources, urban problems connected with population growth, migration, employment, industrial siting, infrastructure, transport, etc.

- . The building process itself has also drawn the attention of NGOs, many of them being specialised consulting organisations which provide expertise mainly in the fields of building materials and housing and technological alternatives. Some of these NGOs are big international organisations orienting their activity to Third World building problems.

- . The consideration of human settlements in the context of community development is another NGO approach to the problem. In this perspective, infrastructure, sanitation, water supply, village industry, waste disposal or treatment, education, etc., are integrated in more comprehensive development projects.

- . The preoccupation with general environmental aspects in human settlements matters is a very frequent activity; protection and conservation of nature, protection of the landscape, rational utilization of natural resources for human settlements purposes, utilization of local resources, community participation in decisions and construction, public awareness of environmental concerns, aspirations to "an ecologically sound life", etc.

1.2 General Trends in NGO Activity in Human Settlements

A. Research

Research is mainly carried out by universities and specialised research institutes or consultancy organisations. Among their aims, urban planning, considering socio-economic and environmental aspects, constitute an important topic, as well as physical planning activities.

Another subject is research on life-styles in

developed urban settlements. This theme has been treated with different emphasis, stemming from energy concerns and leading to new life-style patterns, where social aspects are particularly considered and nature and natural resources are incorporated into the projection of the settlement. Of particular interest is research on renewable resources of energy.

- . Human settlements technology research is an area where NGOs are deeply involved, considering both soft and hard technology, and working along diverse paths, according to the particular situations in their countries. Energy-conserving technology is stressed more in developed countries, while village level technology is particularly underlined in rural areas of developing countries.

- . Research on building materials is another matter of concern in the field of technological research. Sometimes research activity is oriented towards innovative aspects such as the introduction of new materials, the utilization or generation of local materials, or the research on appropriate materials for building in the tropics, in seismic areas or in other specialised situations.

B. Operational projects, technical assistance and training

This concern is very often oriented to the community in general, or to the construction industry, but sometimes the activity deals with particular target groups such as - refugees, nomads, squatters and inhabitants of marginal settlements. Organisations focusing on low-income groups of the Third World are frequently developed-country based NGOs. National scope NGOs are more oriented to problems posed by their specific life situations. For instance:

- . projects aiming to combat different forms of urban stress through public participation and community development programmes, sometimes in the form of urban decentralized settlements.

- . experimental projects specially oriented towards conserving the ecological balance, preserving the supporting systems and their essential elements, such as water, air, fuels, and making rational use of local natural resources. An "environmental responsibility" is promoted in housing, transportation, waste production and disposal, energy consumption and sometimes in the whole way of life.

C. Information, training and public participation

The dissemination of information and promotion of public awareness and involvement in environmental issues is one of the most typical activities of NGOs.

Information on the above-mentioned subjects is provided by periodical or special publications, mass media, exhibitions, etc.

D. Education

Besides informal education, many NGOs are also involved in formal education and academic research. Human settlements is a field included in university curricula throughout the world, and where post-degree studies - mainly in the planning field - are particularly encouraged.

E. Influencing policy and legislative decisions

Some NGOs act as mediators among citizens and municipalities in order to influence legislation in the field of urban renewal, building standards, energy conservation in housing, tenant protection, land-use and other human settlements related topics. Their activities are frequently efficient in influencing legislative spheres and in orienting policy decisions.

2.1 EXAMPLES OF NGO ACTIVITIES IN DEVELOPED COUNTRIES

NGO activities related to human settlements are shaped by living in highly industrialised situations. It is possible to say that the core of NGO activities in these countries is related to the energy issue: the search for alternative sources of energy and application of this to building and design; implementation of energy-saving measures in building, cooling, heating; and the promotion of energy conservation at domestic level. Along with considerations of the physical aspects of human settlements, NGOs usually are concerned with the social and environmental aspects also. This interest has resulted in attempts to live according to new life-styles in the form of novel settlement schemes which are 'ecologically oriented'. Such settlements are likely to be of small dimension, where interaction and contact among dwellers is facilitated and where energy supply can be provided in a rather autonomous way. The settlements are designed to allow the inhabitants direct contact with the natural environment, some self-sufficiency in food production, and a sense of community life without being located in large urban conglomerations. The concern for creation of a sound living environment has mobilised citizens and organisations to concentrate much more effort on preserving and conserving nature and the natural landscape, preventing air, noise and water pollution, and other problems of urban living.

2.11 Energy Conservation in Human Settlements

Measures for energy conservation in housing are becoming an important preoccupation in architectural design, as a response to the energy crisis. Energy waste due to poor insulation, electric heating, excessive use of energy-intensive materials, such as cement and aluminium, non-solar orientation, etc., has been exposed by many NGOs (*Friends of the Earth International* (0455), San Francisco, U.S.A., *Energy Probe* (0074), Toronto, Canada, *Resources for the Future* (0484), Washington, D.C., U.S.A., *Environmentalists for Full Employment* (0453), Washington D.C., U.S.A.

This preoccupation of the developed world NGOs is stressed by the fact that the introduction of solar energy for architectural purposes requires a careful process of building insulation in order to increase the thermal capacity of the structures.

As *Energy Probe*, of Canada stated: "...before any thought is given as to how heat will be supplied to a house, a great deal of thought must be given as to how the heat loss from the house can be reduced to a minimum. Heat is lost through the

walls, floors, ceiling, windows, doors and air vents to the outside, like chimneys. No house can be properly heated, whether from conventional or renewable sources, if most of the heat supply is lost to the outside air. The upgrading of insulation is recommended through double thickness glass on the windows, insulating floors, walls, etc."

The Royal Architectural Institute of Canada (0084), Ottawa, stated in relation to this preoccupation: "Canadian architects were the first in the construction industry to respond to a new energy situation as it developed in 1974. In order to achieve these goals, the Institute prepared a comprehensive Energy Conservation Design Handbook, aiming to facilitate effective design decisions and applications of the available energy systems with regard to developing or upgrading our physical environment". They intended to provide information on energy conserving measures, promoting buildings which are more economical in terms of operational cost and consumed energy, as well as conferring comfort within existing constraints and still responding to the needs and aspirations of the citizens.

Oregon Environmental Council (0479), Oregon, U.S.A., is involved with the quality of urban life, housing, energy conservation, alternative energy sources and in orienting citizen effort on environmental action.

2.12 Renewable Resources of Energy and its Application to Human Settlements

The introduction of solar energy devices in building design and construction has become a very common concern for human settlements related NGOs. *The Center for Habitat and Human Settlements* (0437), San Francisco, U.S.A., initiated an International Solar Development Center in San Francisco as a focal point for a world-wide programme. Their idea is that energy and solar energy programmes cut deeply across nearly all aspects of society, industrialized and developing countries alike. The goals are to assist in the development of energy-providing technology appropriate to the user society.

The application of low-grade solar thermal energy using the Greenhouse Effect (the process of trapping solar radiation between an outer glass layer and an inner absorber surface) is the basis of operation for all solar collectors. *The Minimum Cost House* (0078), at McGillis, Canada, is working on rooftop greenhouses for urban uses. *The New Alchemy Institute* (0513), in Prince Edward Island, Canada, is concerned with an integrated green-house living-unit.

The Institute for Environmental Research (0031), Graz, Austria, deals with a wide range of environmental issues, related to physical and urban planning, renewal projects, preservation of old cities, also research on new energy sources, mainly solar energy, is being carried out.

Many NGOs are providing information to the construction industry. Some of them, such as *Builders Exchange of Detroit and Michigan* (0435) U.S.A., carry out research and education in solar energy application for residential and commercial industrial buildings, as well as into newer kinds of building construction materials.

Energy supply for human settlements is considered in a more comprehensive way in relation to the creation of integrated dwelling systems

and energy-autonomous communities. *Amity Foundation* (0429), of Oregon, U.S.A., developed a housing project based on the utilization of integrated systems of aquaculture, biological waste management and solar dwelling design. Their particular area of concern is the utilization of integrated and renewable living systems and communities.

Among NGOs working on scientific and technical issues associated with energy technologies, it is worth mentioning *I.E. Associates* (0480), of Minnesota, U.S.A. This NGO deals mainly with the development of renewable resources, resource conservation and environmental quality through research, education and consultation, and with land-use in an urban development perspective; emphasizing citizen participation is another concern of the organisation. *I.E. Associates* is currently carrying out research and product development in the area of anaerobic digestion of agricultural and urban wastes for pollution abatement and energy production. Additionally, they are working in solar heating and cooling and energy conservation structures, including a unique type of architectural design that is 'earth integrated' (underground) architecture.

Space for Tomorrow (0149), Paris, France, works to protect and control natural spaces from an anarchic utilization by human settlements. They promoted the utilization of non-pollutant energy sources, particularly solar energy. They also organised a "Sun Day" at national and European level, with exhibitions of technical devices on solar energy conversion.

2.13 New Life Styles

Energy concerns are considered in relation to the search for a new life style. In order to adopt a simple and sustainable life style and to reduce rates of consumption, self-sufficient communities are being developed by *Ecological Life Styles Limited* (0383), Herts., U.K. The action is based on the existence of farms and small-holdings for food production, and ecological housing with the minimum demand on fuel and water, and from which waste can be returned to the soil.

Another organisation making similar attempts is the *Experimental Cities Inc.* (0454), California, U.S.A., who aim to find innovative approaches to social and environmental problems, through the design of "Earthlabs". Earthlabs is a new type of research centre design in the form of semi-self-sufficient settlements; the inhabitants will test social and environmental alternatives with the intention of providing positive guidelines for future settlements.

The Autonomous House Group, Sydney University (0005), Australia, intends to meet housing needs with houses built with recycled waste from the city, independent of reticulated services and able to recycle their own waste. The house-dwellers are supposed to have complete control over their own life styles and welfare. Alternative and integrated technology is used to satisfy these goals.

The process of urban decentralization in the context of ecological and energy-saving techniques has been implemented through many different projects. Some of them emphasize social aspects, such as "neighbourhood renewal" and broad citizen participation. Experimental villages, planned on the basis of small-scale, low-cost and "environment-sensitiveness" are being carried out mainly in U.S.A., U.K. and Canada.

The Institute of Man and Science (0462), Tensselaerville, U.S.A., is engaged in bringing together academicians, scientists, government representatives and members of the various public authorities for the 'renewal of human communities', by first

renewing its social basis. Several projects of community revitalisation intend to rebuild a place "in which people can help each other ... in which we can feel good about our town, our neighbours, and ourselves ... in which we do not waste". The major premise is the encouragement of community initiative and the second one is related to the small-scale of the settlement. The organisation is also involved, together with other institutions, in designing, implementing and testing a Neighbourhood Preservation Support System, as an effort to redirect urban renewal energies and funds previously concerned with city-wide slum clearance to a more focused programme of neighbourhood renewal, and to create a model for other cities and states. Another project is oriented to land-use planning and they have compiled a project report entitled "An Examination of Research Priorities in Land Use".

General Action Committee of the Marolles (0044), Brussels, Belgium, intends to combat the growing dehumanisation of modern urban structures, promoting an urban way of life which develops collective creativity and an increasing participation by the residents in decisions relating to urban development.

The *Regional Resources Project* (0083), of Alberta, Canada, is also interested in the development of small towns of less than 1500 people, considering the natural resources of the region. One pilot project of this type is based on the utilisation of the local coal resources, as a means of promoting the growth of the community. The settlement of industries in the town must be compatible with a small-town environment, ideally non-pollutant, low water use and large employment generators.

The Centre for Research on Well-Being (0126), Paris, France, is an organisation of national scope, studying basically the influence of the level of consumption on well-being including the influence of built-up space on interpersonal relationships; transport systems on the organisation of urban life, etc., together with the development of an original methodology for the study of those issues.

2.14 Urban Environment

In the field of urban environment, NGOs are active in many different matters. An important group of NGOs is concerned with aesthetic values of the urban environment, some related to the preservation of historical buildings, as in the case of the *International Council of Monuments and Sites (ICOMOS)* (0157), Paris, France, alerting public and relevant authorities to the importance of the cultural heritage as a part of the environment. Others are concerned with urban style and landscape planning, such as the *Austrian Garden and Landscape Architects* (0028), of the International Federation of Landscape Architects, Vienna, Austria. Among such concerns, some organisations deal with "beauty" in general, as in the case of "Keep Australia Beautiful" programmes, promoted by, among others, *The Young Women's Christian Association* (0027), Victoria, Australia.

The protection and creation of green areas, public parks, botanical gardens, open spaces, is also a frequent task of NGOs. The *Service Bureau for Playgrounds and Recreation* (0048), Brussels, Belgium, motivate and help communities to increase open and recreational spaces. Sometimes this preoccupation goes further, as in the case of the programme *Greening America's Cities* (0458), Oakland, U.S.A. This organisation intends to transform the vacant land found in every major inner city of America,

usually filled with rubble and refuse, into food-producing gardens, parks and plots, revitalizing inner-city neighbourhoods. The programme's approach is based on "bottom-up community planning, involving residents in every stage of the development process". The success of the programme can be appreciated by the fact that, having started in Oakland, they have attracted the interest of other major cities, including Boston, Chicago, Los Angeles and urban centres in Florida.

The *Future Studies Centre* (0389), Leeds, U.K., is an organisation of international scope, acting as an information point for a network of groups and individuals who are looking into the whole range of future life styles. They are involved, among other projects, in food growing on waste lands, providing initial publicity in the neighbourhood of its site, and looking for advice on technical matters, such as soil testing, irrigation, compost making, and on getting some waste organic matter from the city market for use as fertiliser. The aims are to make people more self-sufficient in food supplies and to provide a starting point for participatory action at a community level. Action and research programmes are currently being planned in cooperation with the 'World Future Studies Federation'.

Sanitation is another important matter related to the urban environment with which NGOs are concerned. Some NGOs treat the problem as a general matter, as in the case of *The Sanitary Board of the Urban Council* (0169), Hong Kong, acting through provision of information, organisation of meetings, seminars and influencing legislative decisions on environmental health and hygiene; they also promote public awareness on the problem through campaigns, such as "Keep Hong Kong Clean Campaign".

Other NGOs are specialists in some aspects of urban sanitation, mainly in relation to waste management and waste recycling, such as *Ruhr Planning Authority* (0159), Essen, Germany. This organisation is dealing with the assessment and quantification of commercially originated waste, carrying out domestic waste surveys, combining domestic and commercial waste tipping, doing research on compost characteristics and developing waste-disposal plants.

NGO activities also relate urban environment to mental health and well-being: for instance, *Ecoplan Institute* (0347), Geneva, Switzerland, which is a foundation for environmental planning, report that during 1975, 1416 persons committed suicide - this being the highest rate recorded in the country. Some research concluded that the general degradation of the environment, the modern way of life and the diverse sources of pollution were the cause of the record, making special reference to the overconsumption of some medicaments. Other diseases due to pollution are also reported, such as nervous and psychosomatic sickness as well as diseases related to contaminated food.

The concern of NGOs for health in industrialised countries is related to recreational aspects connected with appreciation and consideration of nature, as palliatives to urban stress. The *Federation of Victorian Walking Clubs* (0015), Melbourne, Australia, promotes the pastime of recreational walking, the proclamation of national parks and the formulation of wilderness policies. The *Ontario Federation of Anglers and Hunters* (0079), Cambellford, Canada, educates people on the need for clean air, water and soil, for provision of parks and protection of natural resources. The *Royal Dutch Touring Club* (0290), The Hague, Netherlands, participates in the creation of areas for tourism, landscape conservation, transport and traffic issues.

The control and surveillance of urban pollution, apparently under diverse manifestations and

closely related to mental and physical health, is another area of concern for NGOs. Some forms of control come through the exercise of public opinion, and are promoted through campaigns and demonstrations. Pollution standards are disseminated through mass media, and compared with pollution daily records, as occur, for instance, in the press of the city of Madrid.

The *Luxembourg Noise Abatement Society* (0261), Luxembourg, is one NGO concerned with the above-mentioned issues. It is a citizen action group which provides technical assistance and training on monitoring pollution, and which works in connection with the Ministry of Health and the Environment. This society organised a campaign against noise at the national level; it co-operates in exchanging experiences with similar organisations, suggests and prepares legislative measures to stop noise; advocates the maintenance of zones of silence and rest; prepares regulations for the implementation of a law against noise and the measurement of noise from motor vehicles.

Similar preoccupations are shared by *The Dutch Noise Abatement Society* (0281), Delft, Netherlands, also linked with a government agency - the Department of Health and Environmental Affairs, and with the *International Association Against Noise* (0514), Luxembourg. Their field of activity is analogous to the above-mentioned.

2.15 Urban Planning

Of the NGOs concerned with urban planning, a large majority are involved in academic and research activities, whether related to the problems of the region, or to providing assistance to developing countries.

Urban Planning Institute of the Socialist Republic of Slovenia (0504), Ljubljana, Yugoslavia, is carrying out research and providing consultancy in regional and urban planning and design, and organising training courses. Among their activities, the organisation has completed studies in the urbanisation process, urbanisation policies, planning methodology and provision of an information base. Other concerns are the relationships between environmental issues, planning and design; waste management in urban areas from a planning point of view; urban residential environment, criteria and standards; and economic aspects of environmental preservation.

S & L Cities and Land (0291), Rotterdam, Netherlands, is a consulting organisation, working through operational projects, technical assistance and training. It provides planning advice to 140 municipalities and to various governmental and non-governmental organisations, in a wide range of matters related to urban planning:- physical planning and design, urban renewal, landscape design, traffic planning and research, and they are also concerned with public participation.

The *Urban Research Unit* (0024), from the Australian National University, Canberra, is concerned with research and post-graduate teaching on urban planning. They deal with problems of optimal distribution of the population between the cities; changes in inner suburban area housing and housing policy. Other research topics are location of employment within cities; government and administration of cities and regions; financing urban services; equity effects of urban markets and urban policies, energy costs for urban transport and urban development. Apart from the publication of research results, they influence government policy in areas such as land issues.

HUMAN SETTLEMENTS

One NGO involved in planning activities, emphasising the role of local administration and local institutions in the development process, is the *International Union of Local Authorities (IULA)* (0288), The Hague, Netherlands. Among other areas of concern, IULA has been involved with problems of environmental management, with special reference to the role of local governments in environmental control. A comparative study on the use of land and resources over a definite period, at different levels, in developed and developing countries has been completed, pointing out practices and malpractices of the management process in the region under study. Shelter and housing problems, as well as the connected problems of infrastructure, service facilities, population growth, employment, preservation and improvement of landscape and town planning, etc., have been considered in the wider perspective of environmental management.

Academic organisations providing professional education to students in city and regional planning are widespread throughout the world. An example is the *Dept. of City and Regional Planning* (0443), Ohio State University, U.S.A. This organisation provides graduate and undergraduate courses and continuing education in aspects of human settlements and applied and theoretical research in that field.

The *Environmental Studies Institute* (0451), Drexel University, Philadelphia, U.S.A., deals with land use and environmental quality as part of its academic activities.

2.16 Rural Settlements

The consideration of rural settlements in developed countries seems to be closely linked to the need for a sound and natural environment. The "revival" of the countryside and villages, as *Undercurrents Limited* (0422), London, England, proposed, goes together with the suggestion of a self-sufficiency movement in the U.K. and the subordination of technology to a new life style.

Preservation and conservation of the countryside is another matter considered by some NGOs. The *Council for the Protection of Rural England* (0382), London, England, for instance, intends to protect rural areas from economical change, due to the excessive agricultural improvements and drainage systems. Physical planning for optimal land use, becomes imperative in many developed countries where land resources are required for many development alternatives. The protection of traditional peasant houses and settings, promoting their maintenance and restoration according to the characteristics of each region, is a task undertaken by *Peasant Homes* (0146), Issy les Moulineaux, France.

2.17 Information, Training and Public Participation

The dissemination of information and promotion of public awareness of environmental issues is one of the most typical activities of NGOs.

The *Building Information Institute* (0119), Helsinki, Finland, was created with the purpose of providing a broad and unified information service. At the present, the institute works in four mutually complementary areas: applied research, standardisation, as an essential prerequisite for industrialised building, building centres and distribution of relevant printed material. The creation of a network of information and skills exchange is an important aspect about which NGOs are concerned, for example - *Skills Exchange Network for a Stable Economy (SENSE)* (0414), Havant, U.K., promotes the exchange of practical skills leading to local autonomy and co-operation, with special emphasis on cooperative communities and rural resettlements.

2.18 Influencing Policy and Legislative Decisions

The NGOs frequently use legislative and political activities through information campaigns and promotion of public involvement. An example of an NGO whose actions are directly in this line is *The Institute on Housing and Environment* (0156), Annastrasse, German Federal Republic, functioning as a bridge between research and users of the built environment. Their "clients" comprise first the various levels of the administration, then parliamentarians or decision-making committees, and finally citizen associations and consumer groups. They have influenced several bills in the field of urban renewal, modernization and energy conservation in housing topics.

2.19 Education

A wide range of academic NGOs are related to human settlement concerns. Examples are: *Carnegie-Mellon University Programme in Humanities and Technology* (0436), Pennsylvania, U.S.A., which supports research and teaching in the area of technology and society, this includes cities and technology; interaction of the process of urbanization and technological development. They carry out comparative research among U.S.A. cities and cities in other nations.

The *Institute for National, Regional and Local Planning* (0351), Zurich, Switzerland, is an academic institution dealing with post-graduate studies and research on regional planning. Their field is physical planning, oriented towards a rational use of space.

Non-academic and informal education is carried out also by NGOs: *The National Council of Churches* (0471), Energy Project, New York, U.S.A., is an organisation of national scope, involved in religious and philosophic activities. They promote an ecological approach to development, human settlements problems and energy, through the production of educational materials, organisation of meetings, education action projects and the establishment of a network of information on appropriate technology.

The *Oregon Environmental Council* (0479), Portland, U.S.A., is an educational and citizen action group, acting also as resource and information clearing house. They have 2500 active members, acting within a regional scope, as an "earthwatch Oregon". The organisation promotes citizen awareness and educates people on some important environmental problems of the region, focusing environmental concerns on local legislators. They are specially concerned about the quality of urban life; other areas of interest are the advance of neighbourhood-scale technology; land-use planning; alternative sources of energy and housing energy conservation.

2.2 EXAMPLES OF NGO ACTIVITIES IN DEVELOPING COUNTRIES

In developing countries, human settlements are treated very often in the context of development projects. These projects deal mainly with shelter, infrastructure and services, including sometimes education and training activities, oriented towards the promotion of a self-reliant development at community level.

Generally, NGO activity deals with two different ranges of problems: one related to urban growth in big towns and cities, sometimes of

potentially explosive characteristic, as in the case of some Brazilian, Mexican and South Asian urban centres; and a second one related to rural settlements, communities and villages in backward regions.

Many national and international NGOs are involved in activities related to the above-mentioned aspects. Overpopulation in some cities of the developing world bring together serious housing problems, such as slum areas, squatting, sanitation deficiencies and pollution. In rural settlements, sanitation, housing and water supply are also problems dealt with by NGOs. The proposed solutions are usually integrated development projects, most of the time of local scope; or they are more specifically related to building material, low-cost housing, co-operative programmes, self-help, etc.

2.21 Human Settlements Problems in the Context of Community Development

For rural settlements, villages and communities, shelter aspects are usually treated by NGOs with a holistic approach, considering services, generation of productive activities through village industries or agricultural projects; energy supply and village level technology, and the provision of basic supplies, mainly of water.

NGOs active in this field are frequently action-NGOs, implementing operational projects, providing technical assistance and training or carrying out research. These activities are illustrated by some examples:

The Ghana Young Farmers Club (0160), Cape Coast, Ghana, is an organisation of international scope, which has a total of 5,383 members. It is involved in education, training and mobilisation of youth in the process of community development through resettlement projects and cooperative groups. These groups are organised for collective farming, meeting in that way the food requirements of the community. The groups resettle in farm areas and create a village or settlement of their own, organising public services, sanitation facilities and education, including adult literacy classes. Projects like baking or fishing and such activities - depending on the resources of the region - are planned in order to provide employment and a means of subsistence to the members of the community, and of preventing rural-urban migration. The basic idea, as stated by the organisation is: "to plan community development as an answer to the felt needs and preferences, without imposing on them a life style which they do not necessarily need. This requirement leads to the principle of community and citizen participation."

Africare (0267), Bamako, Mali, carried out projects oriented towards improving the quality of life in Mali, by developing water resources, agricultural production, stockraising and health services. The organisation has an irrigation project for a market gardening operative as well as projects on building, repairing and digging wells.

The Village Reconstruction Organisation (0224), Guntur, India, implemented housing programmes for village communities, considering the provision of environmental and protective village services as well as sanitation and health training.

Landless persons, including refugees, are the target group of *Tamulpur Anehalik Gramdam Sangh (0222)*, Assam, India. The organisation, acting within a local context, finances irrigation and training projects and works on the rebuilding and development of the Gramdam villages, as a way of fighting against poverty.

Similar tasks of settling the landless, village

reconstruction, irrigation and water supply projects (wells and reservoirs), together with workers' and farmers' training and adult literacy classes, are provided by *Shramabharati (0291)*, Bihar, India.

In Malaysia, the *Environmental Protection Society (0265)*, Selangor, a citizen action group, gathers information and influences policy in favour of squatters in the cities and the very poor in rural areas, emphasising sanitation and children's situations. It has contacts with the *Malaysian Organisation of Human Settlements*.

The Port Moresby Community Development Group (0315), Waigani, Papua New Guinea, launched an integrated project on assistance in squatter and resettlement areas including housing, provision of water and sanitation, employment, community centres and markets.

A comprehensive development of poor communities is the goal of the *Anand Niketan Ashram Trust (0175)*, Gujarat, India, an organisation of national scope. They created new villages based on justice and implemented through an integrated development project, providing irrigation, new seeds and fertilizers to improve local agriculture; installation of 1,000 methane plants run on cow-dung; a cooperative community development scheme is also being promoted.

Lanka Jatika Shramadana Sanga Maya (0333), Moratuwa, Sri Lanka, have as target groups those villages which are economically depressed, thus trying to promote social change through non-violent means. Among their projects is a composite project for the use of renewable energy, bio-gas, solar energy and wind power, in collaboration with the *Eindhoven University (0282)* and the *Tool Organisation (0293)*, of Eindhoven, Netherlands.

Some development-related projects mentioned by the NGOs include the following:

- Self-reliant development, based on the cultural characteristics of each region and including technological research, indigenous technology and agrarian reform, e.g. the *Association of Agronomists of the State of Sao Paulo (0056)*, Sao Paulo, Brazil.

- Integrated rural housing, e.g. *The World Association for Rural Housing (0503)*, Caracas, Venezuela.

- Self-aiding housing programmes, e.g. the *Korean Institute of Architects (0257)*, Seoul.

- Self-help, education and cooperative movements, e.g. the *Social Welfare and Guidance Association (0230)*, Surakarta, Indonesia.

The consideration of appropriate technology to meet basic needs of the community seems to be a basic element in community development projects (see *Appropriate Technology* chapter). Just some examples to illustrate the point are as follows:-

The development of home-living technology, in order to provide utilities and services to rural communities, has been implemented by the *Appropriate Technology Development Association (0176)*, Lucknow, India, among others, in the area of house-building and construction materials; village water supply, drainage; disposal of human excreta; kitchen fuel and home lighting, etc. The main idea is to provide low-cost, decentralised and small-scale technology, adequate to meet basic needs according to the requirements of the population.

In Lima, Peru, the *Peruvian Association of Sanitary and Environmental Engineering (0320)*, deals especially with sanitation in the city of Lima. The aim is to achieve a proper elimination of the solid wastes. In that regard, the organisation promoted the creation of a Metropolitan Corporation for urban cleanliness. An important project is the San Juan project, in which polluted wastes from the city are used for irrigation (after treatment). The waters irrigate sandy soil in which a forest will be created to be used as green space for Lima. The city lacks green areas and has serious air pollution problems. Another objective of the organisation is to up-date the National Building Code in order to improve domestic living conditions.

The *Ecodevelopment Center (0275)*, Mexico D.F., Mexico, is working in two main areas: one is the rural environment, in relation to new human settlements and the improvement of the old ones; and two is the urban environment, basically with marginal groups and slum areas. The organisation is working in 62 slum areas, through self-help construction, housing, sanitation and services improvement. Another project is on integrated energy systems, oriented to providing energy in rural areas. Regarding this purpose, an on-going project is concerned with the utilisation of solar, wind, geothermic and bio-gas sources of energy.

The *Department of Geography (0302)*, University of Jos, Nigeria, is a research and teaching organisation concerned with urban environmental management in Jos town, as part of the Masters degree programme. Some case projects have been on waste disposal and management; environmental sanitation conditions and ill-health correlates; urban land-use characteristics and dynamics; and resettlement schemes in Jos plateau. The consideration of the environmental problems through an integrated approach is promoted in urban and regional-planning activities.

The *Social and Economic Development Center (0051)*, Cochabamba, Bolivia, is involved in raising the environmental awareness of the community; orienting citizen action to the creation of green areas; planting trees in schools and inner city areas. They are also concerned with waste disposal.

Housing programmes in marginal settlements are carried out by some NGOs such as the following:

The *Institute of Urban Housing (0116)*, San Salvador, El Salvador, is engaged on projects of rehabilitation and reallocation of marginal settlements. The work consists of construction of infrastructure, especially sewage systems for waste and rain water. They are particularly interested in the utilisation of local building materials, such as soap stone, volcanic stone, clay and white sand. The utilisation of human labour in the artisanal elaboration of mud and cement bricks is encouraged. Other projects deal with reforestation programmes with the collaboration of community groups. Targets are low-income people and the aim of the organisation is to give safe and economic houses to as many families as possible.

The *Latin American and Asian Low-Income Housing Service (0091)*, Santiago, Chile, is dedicated to planning and activity for low-income people. Each country member of this institution has its own programmes and/or projects, and its own operative techniques, appropriate to the situation of their countries or regions. Projects are intended to use materials which are local, cheap and easy to use. Community development programmes run along with environmental improvement and rational use of natural resources. They underline the necessity of afforestation of the human settlement environment. Indigenous technology, which is easy to control by the people concerned, is preferred to techniques and materials originating in developed countries.

2.22 Building Materials and Low-Cost Housing

The introduction of new materials or the pre-occupation with the utilisation and generation of local ones is widespread in developing countries.



The *Housing Research Foundation (0095)*, Medellin Colombia, is a research organisation, investigating the usage of materials and building methods with special emphasis on recoverable materials from solid waste to be used as building material for very low-income housing projects.

The *Pelegano Village Industries (0054)*, Gabarone Botswana, through operational projects, technical assistance and training, has initiated an integrated community up-lift. Among other activities mainly village industries, they launched a project on building materials, for low-cost rock-walled buildings. One hour's instruction is sufficient for a totally unskilled person to build house walls with this very simple technique.

The *Appropriate Technology Development Association (0176)*, Lucknow, India, has been engaged in designing low-cost houses for rural areas which are more durable and economical in the long run, according to the availability and suitability of materials. It has been found that the local materials for building, like mud, bamboo, timber, grass and thatch, available almost free of cost in the past, are not now available. They are considering whether it is possible to substitute those materials with new materials for building and to organise the manufacture of the new materials at village level. Another activity is finding methods for providing sanitary latrines for households, water supply and rural sanitation techniques.

The *Technological Research Institute (0060)*, Sao Paulo, Brazil, carried out research on building materials, processes and systems, with emphasis on wood research. They deal also with the transfer of existing or new technology to industry and private systems and with socio-economic issues.

The *Housing Research and Development Unit (0248)* Nairobi, Kenya, is concerned with research and development of human settlements with special interest in low-income housing; provision of shelter, infrastructure and services, and design and development of self-help housing schemes in urban settlements. They have a general interest in the use of natural resources such as water, wind and solar energy in human settlements, as well as an efficient utilisation of land in community development projects. A

special emphasis has been put on the utilization of locally manufactured building materials for low-cost housing. The organisation has participated in the preparation of the national development plan with relation to the housing sector.

The *West African Building and Research Institute* (0162), Kumasi, Ghana, is concerned with low-cost housing, with an emphasis on locally available materials, use of bauxite waste for the production of pozzolana, use of agro-industrial wastes for the manufacture of building materials, and utilization of local limestone deposits for lime and cement production. They are also concerned with building codes and regulations for Ghana. One specific interest is building construction for tropical climates.

2.23 Renewable Resources of Energy

Energy research on renewable sources of energy is more oriented to domestic and agricultural uses in rural settings than to consideration of its use in architectural design.

The *Environmental Foundation* (0276), Mexico D.F., Mexico, is concerned with the improvement of rural settlements in harmony with nature, aiming to satisfy basic human needs in a self-sufficient way. Experiments to produce energy and food have been carried out, such as the construction of digestors for bio-gas production; wind energy generators, built with waste materials and solar cells for solar energy utilisation. It is expected that the quality of life of the settlement will be improved through food production innovations, which would include projects on pisciculture, cuniculture and hydroponics. The idea is to use natural resources, not only for a self-sufficient supply, but also to create surplus production, which can be marketed throughout the rest of the country.

Studies in the use of solar energy and the development of self-sufficient unities, has been carried out by the *Laboratory of Construction* (0311), University of Panama, Panama. An interesting experimental integrated ecological approach was undertaken by *Sri Aurobindo Society* (0220), Pondicherry, India. The Society built Auroville, where "eco-houses" were conceived, utilising wind and solar energy, the surrounding land providing food. An increased yield was obtained through organic agriculture; algae and urine were used as fertilizers. Afforestation practices were carried out in an attempt to improve the microclimate. The conservation and rehabilitation of soil resources was achieved by planting scrub in order to stop erosion. Irrigation was provided by dams.

The *Department of Mechanical Engineering* (0189), College of Agricultural Engineering from the University of Punjab, India, is involved in teaching and carrying out research on the utilization of solar energy for the creation of an optimal environment for animal and plant production. In housing, solar heating and cooling devices were designed for buildings in Northern India. An area of concern of the Department is the design and development of solar collector units for the production of high pressure steam and vapour for application as an alternative energy source.

2.24 Urban Planning

Urban planning is an important academic and research activity in developing countries.

The *Institute of Development Studies* (0202), University of Mysore, India, is carrying out research in environmental and social aspects of development, training professional planners in urban, rural, regional and environmental aspects. With special reference to human settlements, the organisation

completed a study on the influence of official standards on shelter provision in Asia for the Scientific Committee on Human Settlements (Paris and Nairobi). They are completing and assessing the national responses to the Vancouver recommendations on Human Settlements in seven Asian countries in collaboration with the International Institute for Environment and Development, London. An on-going project is related to the role of small towns and their viability in rural areas in collaboration with IIED, London.

System Analysis of Mediterranean Desert Ecosystems (0115), Alexandria, Egypt, is dealing with the preparation of a comprehensive ecological description of the Human Settlements in the Mariut region (NW coast of Egypt, extending 90 kms. west of Alexandria and 30 kms. wide) to improve the understanding of the interrelationships and interdependencies of human society and the natural environment of the region. They are also gathering information on a wide range of biosocial and ecological variables for this ecological description. They aim to provide, through improved formulation of plans, for the social, economic and demographic development of the Mariut region, such that local ecosystems may attain maximum sustainable levels of productivity, so that the local population may experience a high level of health and well-being and that the region may be characterized by ecological equilibrium and societal harmony. The general objectives also include demonstrating the value of an integrated ecological approach to problems of land use development in arid regions; training on methodology of integrative ecological studies on human settlements.

The *Eastern Regional Organisation for Planning and Housing* (0190), New Delhi, India, promotes and coordinates through the region the study and practice of housing and town and country planning. Among their aims is to secure higher standards of housing, to improve towns and cities, and to plan a better distribution of the population.

2.25 Influencing Policy and Legislative Decisions

This is another field where NGOs are active. Some examples of this concern follow:

Friends of Nature (0101), Guadalupe, Costa Rica, works in contact with municipalities influencing local legislation on human settlements. Their activities are also related to the organisation of communal development, intending in that way to obtain an agreement on human settlement matters, between municipalities and citizens.

The *Ecological Group of the University of Tolima* (0094), Ibagué, Colombia, is involved in provision of information and educative activities in environmental issues. Their main goals are the research, dissemination and reporting of environmental impacts, influencing governmental decisions on these matters. They have been concerned with the preservation of the supporting systems of human settlements; on the contamination processes affecting human settlements through agricultural pesticides, waste products from a cement factory, discharges of sulphuric acid into a river; contamination from a copper-processing plant, etc. These findings have been reported by the organisation drawing the attention of the public and legislative spheres.

2.26 Education

NGOs are concerned with both formal and non-formal education. The first one is oriented to urban planning and provided by universities.

The latter is directed to promoting participation in self-help settlement projects, or improving the quality of life of communities through diverse activities (small-scale industries and crafts, village level technology, literacy, sanitation, investigation of local building materials, etc.).

The *Tongolese Association of Christian Volunteers at Work (0376)*, Kpalime, Togo, is a citizen action group, acting in villages by providing education and other assistance. The organisation holds conferences and seminars concerning rural and city improvements. They also participated in literacy campaigns.

The *Association of Public Health Officers (0246)*, Nairobi, Kenya, is an educational organisation involved in the advancement and diffusion of knowledge regarding sanitary sciences. They have 150 members and started their activities in 1959. They are involved in the improvement of sanitation in houses and of waste disposal; provision of potable water; and pollution control in the area of the settlements. The target groups include school children, businessmen and the general public, using methods such as influencing leaders. They concentrate mainly on rural areas.

Interamerican Planning Society (0277), Mexico DF, Mexico, is a regional international NGO, having member organisations in all Latin American countries and in some countries in Europe, Asia and Africa. It was created in 1956 and the total number of active members is 1500. They organise meetings and conferences and provide technical assistance and training. Apart from the Interamerican Congress of Planning, the organisation has promoted, organised and sponsored international meetings to discuss social environmental and economic issues related to precarious human settlements in Latin America and Africa.

2.3 "Development-Assistance NGOs"

NGOs involved in human settlements are included in local, national, regional and international categories. Particularly noteworthy is the involvement of a large number of "development assistance NGOs" in human settlement issues.

Among international NGOs, some are oriented to the treatment of human settlements in the perspective of development projects, while others are concerned with more specific aspects of building materials, architectural design, town planning or housing problems of less-privileged people.

The *German Development Assistance Association for Social Housing (DESWOS) (0151)*, Cologne, West Germany, is a private professional consulting organisation offering expertise in low-cost housing for developing countries. Their target group is the vast majority of the poor, by far the greatest part of the population who do not have a regular income - to find ways and means of providing housing which is as economical as possible with regard to resources and funds needed. Self-help projects by the population is one of the most important pre-suppositions by DESWOS for cost reduction in the field of housing. Among the best known of these self-help projects are the "site and service" schemes where building land is developed and provided with minimum infrastructure and public facilities. The construction of housing is left to the future inhabitants themselves, on the basis of self-help, expert assistance being provided.

Other types of projects are the "squatter-upgrading" projects. The existing housing in spontaneous settlements is retained as far as possible, but is improved. A minimum of infrastructure, in the form of water taps, sewers and walkways,

is provided in existing places. Also in this case, self-help is promoted and supported; for instance by loans for construction material. Of particular significance for this purpose is the use of inexpensive local building materials which replace imported materials, and the participation and training of the local population. Various projects in Africa and Latin America have been implemented by DESWOS.

The *Institute for Building in the Tropics (0155)*, Starnberg, Federal Republic of Germany, is a consultancy Institute, carrying out research on low-cost housing in developing countries: construction systems, materials, and building methods, appropriate to the tropics, have been developed, with a minimization of unnecessary technical installations by appropriate planning (cross-ventilation, sun-shading, utilization of non-polluting energy sources). Another research area is related to specific problems in warm climates, such as typhoons, termites, etc.; also, a research project on Earthquake Resistant Structures for low-cost housing has been developed in El Salvador. The organisation owns a large collection of publications on planning and building, with particular reference to tropical regions.

SCET International (0147), Puteaux, France, carry out interdisciplinary services in rural, regional, industrial and tourist development, urban planning, through research and implementation projects.

The *Department of Architecture (0012)*, University of Queensland, Australia, is concerned with research in buildings for the tropics. Their International Research Programmes related to tropical building are:-

- prefabrication for low-cost housing in tropical areas, with special reference to the potential of indigenous materials,
- public housing in Colombo, with special reference to accommodation standards for low-income groups,
- a study of the influence of traditional culture on the building style, through a case study in Northern India. Design criteria were recommended to assist development without undue stress to the fabric of village life,
- building design and construction in seismic areas, with special reference to Papua New Guinea.
- self-help housing for migrants in Port Moresby, Papua New Guinea; etc.

Vita (0493), Maryland, U.S.A., provides assistance and information on technical problems to more than 100 developing countries. Vita's 'Village Technology Handbook' provides a directive for many do-it-yourself activities. Areas of particular interest to Vita are water and sanitation; low-cost housing and construction; crafts production and marketing; small-scale industries; alternative energy systems; food processing, etc.

Other target groups for international NGOs are refugees and nomads. Programmes of rural refugee settlements in Africa and settlement of landless workers in India and Bangladesh are supported by the *Lutheran World Federation (0357)*, Geneva, Switzerland, through its branches in various African countries. The *League of Red Cross Societies (0356)*, Geneva, Switzerland, is also concerned with resettlement of refugees and displaced persons. The organisation provides assistance and promotes environmental hygiene in rural areas and transnational settlements in developing countries. Their operational projects, giving technical

assistance and training, refer to human and social aspects of the environment: urbanisation, high density buildings, slums, etc.

Caritas Internationalis (0235), Rome, Italy, is concerned with Angolan refugees in Portugal. Portuguese Caritas elaborated a vast aid programme aimed at grouping refugees in rural cooperatives and entrusting large uncultivated areas under their care. The programme also includes the construction of dwellings for the refugees as well as vocational training for youth.

The settlement of nomads in the Sahara and neighbouring regions of Sahel and the Upper Plateau of Algeria, is an activity of the *Centre for African Studies* (0325), of the University of Warsaw, Poland.

3.1 CONCLUSION

Generally, it is possible to discern that the environmental dimension is beginning to be incorporated in different ways into architecture, urban design and planning. Innovative research in energy conservation in housing is being carried out in developed countries, aiming at a maximum efficiency in the use of energy resources and at the introduction of renewable energy sources to architectural design. Also of concern in human settlements related activities are ecological balance, support systems, utilization of local material resources.

Besides practical considerations, human settlement NGO activities are oriented to the awareness of new values, towards nature and the surrounding environment and towards an innovative use of resources, such as an integrated system of supply of some goods, waste recycling processes, autonomous housing, community revival, urban decentralization, and promotion of particular life styles.

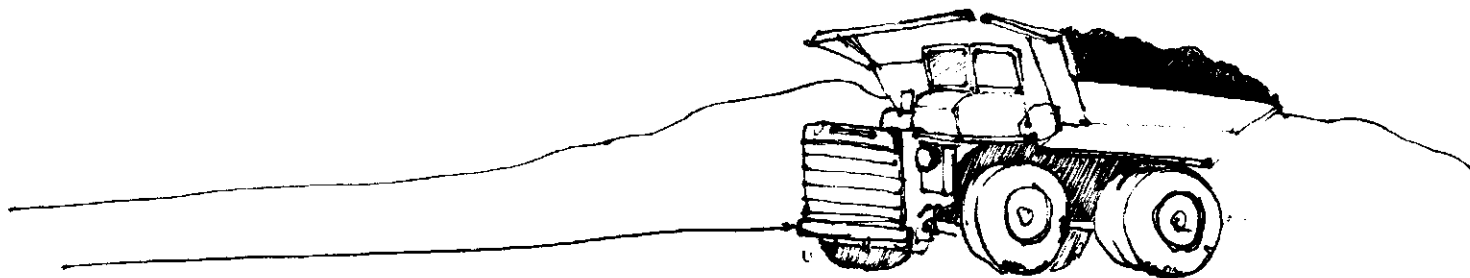
Sometimes, human settlement issues are viewed in a comprehensive perspective, comprising not only shelter in cities but also in the surrounding areas, energy and the other supplies and human values included in community life.

In other cases, human settlements is treated as a limited architectural problem focusing on the technical aspects of building. Research on "appropriate" building systems, suited to some specific environment such as the tropics or a seismic area, are undertaken; also there is research on building materials, restoration, conservation, building standards, etc.

Academic activity is particularly rich in this field, and a great deal of innovations come from Universities all over the world. Urban, physical and regional planning are particularly stressed by academic NGOs.

Consultancy and expertise organisations are also wide spread, some of them being international-assistance organisations, aiming at the low-income groups of the Third World.

An integrated development approach to human settlement problems is being carried out in many countries of the developing world, mainly in rural areas. The aims are the improvement of the quality of life, which includes the promotion of economic activities and technological knowledge, as well as the search for some approach which can really break into the cycle of poverty. In India, Papua New Guinea, some of the African and Latin American countries especially, these integrated programmes are organised around appropriate technology, ideals of an endogenous and self-reliant development process, community participation, education and training programmes.



1.1 GENERAL STATEMENT

There is a clear difference in orientation of NGOs in developed countries and those in developing countries, related to 'over-development' in one region and 'under-development' in the other. This difference stands out particularly in relation to the use of natural resources.

The affluence of developed countries has frequently resulted in environmental degradation which NGOs act to prevent by campaigning for changes in life style to a less consumptive style with greater use of renewable sources of energy, efficient use of energy, less waste, recycling, nature conservation, limits on pollution and population planning, etc.

The protection and conservation of natural resources is at the back of most of the numerous issues concerning environmental NGO activity in developed countries. The need for this is because of NGO perception that there is on-going environmental degradation resulting in a deterioration in the quality of life now and in the future.

In contrast to this is the NGO activity in developing countries where exploitation of local natural resources is seen as a means to development and an improvement in the quality of life, so that use of natural resources for development is at the back of all their work.

Resulting from the two differing orientations of developed and developing country NGOs, are different ways of deciding where the efforts of each NGO will be concentrated. In developed countries, NGOs tend to concentrate on particular issues. An NGO may work on several issues at once but for each there is some concentration of activity, some dividing line between activities for one issue and another.

To provide an illustration of the issue-oriented approach of developed country NGOs we take the example of a North American NGO interested in acid rain. In the USA, acid rain is a result of land-based production mainly from the electric utility industry and the air pollution which results. To quote one NGO, *Friends of the Earth* (0455), (FOE), San Francisco, which is dealing with this issue, "In addition to causing hundreds of millions of dollars damage to US agriculture every year, so-called 'acid rain' kills fish, ruins soils, degrades forests, and erodes limestone, marble and other construction materials." ('Not Man Apart' Vol.8, No.5, Mid-Nov./Dec. 1978). This destructive phenomena therefore affects both land and water-based production and industrial production; and damages an enormous range of natural resources which include air, water, soil, forests and other flora.

Developing country NGOs more or less have one 'issue' - development - and this is a multifaceted and integrated process, so that they may concentrate on one aspect such as water supply, but are more likely to spread their activities so that they are concerned with a multitude of related aspects. An example of the developing country integrated approach would be where, in the interests of development, the NGO gave training courses on crop grow-

ing, poultry raising and fishing; developed appropriate technology for farm equipment made from local materials; dug wells for potable water, built irrigation channels, assisted in the building of latrines and the placing of rubbish heaps.

Each developed country NGO usually has a consistent pattern of methods used to deal with each issue, which gives the NGO a certain distinct character. Take, for example, the NGO mentioned above - FOE, San Francisco - they use a combination of methods for each issue which can include lobbying, letter writing, publicising through the mass media, demonstrations in public, and educating through their publications which include periodicals and books. For comparison, the methods of the *Natural Resources Defence Council* (0475), Washington, DC, USA, depend more on legal and administrative actions to force cities and industries to protect such natural resources as air and water. However, they also try to educate the public on the need to conserve and protect natural resources and they attempt to influence legislators to make the appropriate supportive legislation for this. Using such methods they have tackled successfully many issues which included soil erosion, and the need for improved land use practices; air and water quality in urban areas; prevention of nuclear power; and the destruction of the ozone shield by fluorocarbon propellants from aerosol sprays.

This consistency in methods used to approach tasks is a characteristic of developing country NGOs also. However, the NGOs in developing countries often have the opportunity to be the change-agents needed in a particular local area to further development by actually tackling the work needed. They are less likely to have the means to conduct mass awareness campaigns and to put pressure on government members to bring about change such as in making a new legislation or enforcing existing legislation, as is the case in developed countries.

The NGO activities in relation to the use of natural resources have been divided according to the function these activities serve. In many cases, the interrelationship between the activities of an NGO makes it possible to place it under several or over all functions. However in the examples used, which follow this section, an NGO will be used to illustrate only one function. It was particularly difficult to sort NGO activities in developing countries into functions because almost all of them are to 'foster development' - however, some division has been made where they serve other functions as well for the sake of clarity.

The main kinds of NGO activity are as shown overleaf.

Developed CountriesDeveloping Countries

- | | |
|--|--|
| <p>A. Research on the use and availability of natural resources and the effect of development on them.</p> <p>B. New approaches to and new uses for Natural Resources</p> <p>C. Correction of development patterns which are destructive of natural resources.</p> <p>D. Planning of development for protection and conservation of natural resources.</p> <p>E. Education, both formally and non-formally on the use of natural resources.</p> <p>F. Provision of information on the use and misuse of natural resources.</p> <p>G. Conservation and protection of natural resources.</p> | <p>A. Research on the use and availability of natural resources and the effect of development on them.</p> <p>B. New approaches to and new uses for Natural Resources</p> <p>C. Fostering development.</p> <p>D. Planning of development for protection and conservation of natural resources.</p> <p>E. Education, both formally and non-formally on the use of natural resources.</p> <p>F. Provision of information on the use and misuse of natural resources.</p> <p>G. Conservation and protection of natural resources.</p> |
|--|--|

1.2 General Trends in NGO Activities inDeveloped Countries

The issues taken up by NGOs in developed countries nearly all touch on the use of natural resources or the effect of productive processes on them. There are, therefore, thousands of NGOs in developed countries active in some way over the use of natural resources and which could be given as examples to illustrate this chapter.

The following summarises the main activities of these NGOs in approaching issues (no order of importance is intended) :-

A. Research

Research is being carried out on the availability of natural resources and the effect of development on them.

Perhaps the main impact of the work of NGOs involved in research is that the information they make available as a result of research can be used as a basis for well-informed policy decisions for those in industry, agriculture and government who determine the use of natural resources. They may also be able to show several options to choose from in the exploitation of natural resources and the possible environmental impacts of each option. Research can be used to locate and quantify natural resources and this is a field of particular interest in the search for food resources in the oceans.

The NGOs involved in research are almost invariably well-endowed institutions where the research is carried out by highly trained and educated personnel and sometimes by post-graduate students. It is common for there to be a degree of multi-disciplinary research rather than specialised in one subject area. In the survey, the physical and natural sciences were the subject of research by all but one NGO, the latter researching mainly in the social sciences. Most of these NGOs provide a consultancy service to such bodies as local authorities, governments and other non-government organisations.

B. New approaches to, and new uses for Natural Resources.(i) New approaches to the use of Natural Resources

Three of the main areas in which NGOs are active in finding new approaches to natural resources are in appropriate technology, energy conversion and human settlements. Reference to the chapters on these activities should be made for more details. Land use and conservation are also others where a number of attempts are being made to change current practices for something better. The attempt to find new approaches has been necessitated by the destruction of natural resources due to environmentally inappropriate development and NGOs are seeking ways, not to prevent development, but to find alternative life styles and development patterns which conserve and protect the environment.

In most cases, practical use is made of new approaches by the NGO to prove the approaches can be used. Their successes are then publicised to gain support. Many of the attempts to find new approaches in developed countries are related to a desire to encourage greater self-sufficiency, especially in food production. Self-sufficiency is seen, usually as an attempt to halt consumerism, protect the environment and improve the quality of life.

Although the NGOs serving this function may have some salaried staff, it is common for them to rely on citizen participation for carrying out the work and as proof of the approach being workable and worthwhile. They also usually rely on their activities to generate funds in total or part, rather than just relying on subscriptions and gifts.

(ii) Innovative uses for Natural Resources

In the survey, innovative uses were shown to have been made of the following natural resources: jojoba plant products to substitute for sperm whale oil; spiderwort (*tradescantia*) to detect radiation; farmed wildlife for food; indigenous plants and herbs for food and medicine; spirulina, an algae, for food; mangrove tree use is being researched; marine resources for food; weeds and earthworms to aid agriculture.

In all cases of NGOs in the survey coming under this heading, they devoted considerable effort to educating others about the uses of the natural resources that they were developing. In no case was the motive profit, but rather to save an endangered species; to develop farming which does not disrupt the ecological balance; to find new sources of food; to be more self-sufficient in health care.

The NGOs commonly shared their new knowledge through personal correspondence, periodicals which they published, or other published material such as booklets, conferences, seminars, and fairs. They usually have salaried staff, although one NGO was entirely a voluntary citizens organisation.

C. Correction of development patterns

This function related to efforts of NGOs to change any development which may have an unfavourable environmental impact of short or long-term effect. It is not a negative trend although those who may have found some benefit

in the development intended may view it as such, in the words of the *Sierra Club of Alberta*, (1987), Alberta, "Not blind opposition to progress, but opposition to blind progress". Of the issues taken up by NGOs and reported in the survey, there always appears to be evidence of clear negative impacts on the environment from the particular development project being opposed. The main areas where development projects were opposed were: where natural areas or forests would be destroyed or their ecological balance changed; mining of uranium for production of nuclear power and the killing of marine mammals for their products.

When NGOs propose that it is necessary to stop certain development projects they have only been successful where they can arouse substantial public support, thus most of these NGOs are citizen groups who may have some salaried staff but of a tiny proportion compared to the total membership.

In the case of development projects spoiling natural areas or upsetting the ecological balance, the issue is frequently local and local public support is sought to prevent it. Uranium mining is an example of one issue which became a major national issue in Australia and when related to nuclear power can be regarded as an international issue.

The protection of marine mammals is an issue having much support in North America but also in other developed country regions adjacent to seas in which the whaling industry is carried on including the United Kingdom and Australia. These NGOs usually make a great effort to publicise their issue through the mass media and sometimes by public demonstrations, and also to educate the public and appeal to their reason to get them to take a stand in support of the NGO view. The education may be done through NGO publications, films, talks, conferences, etc.

D. Planning of development

This NGO activity is mainly one carried out by professionals in planning, architecture and landscape design, in relation to local authority and government attempts to plan new urban developments based on environmentally sound principles. They may carry out research, provide formal courses in various kinds of planning, especially regional planning, and serve as consultants to industry, government and other NGOs.

E. Education

Environmental education is so much a part of NGO activities that a great proportion of environmental NGOs could be regarded as falling under this heading. There are NGOs which are involved in formal, non-formal, both formal and non-formal, and adult environmental education. Their methods vary from class-room lectures, conference lectures and talks, to informal meetings, films, slides, publications, to actual experience in the field, collecting data, experimenting and observing. NGOs serving some kind of educational functions are of every kind - from small to large, those using mainly salaried staff, to those whose staff is wholly voluntary, from those concerned with one issue to those whose interests range over many issues.

The need to be involved in environmental education is very much a result of the issue-oriented approach used by most NGOs, they need to educate their members and the public on issues which arise as they arise. The environmental problems which NGOs handle as issues are often partially a result of ignorance and inactivity and the NGOs use education to show people the need for action or change over the use or misuse of natural resources.

F. Provision of information on the use and misuse of Natural Resources.

This is a function which, like the previous one - education - is carried out by most NGOs. The methods of providing the information can be through publications such as periodicals, research reports and books, booklets and posters; through the mass media as interviews, prepared programmes and press releases; through events for the public such as fairs, exhibitions, demonstrations, meetings, or even, as in the case of one NGO, in the survey, through life-sized models of whales.

G. Conservation and Protection

This is a function which is well established among NGOs in developed countries. There are two ways issues under this heading are handled - either the NGO takes steps to conserve and protect the natural resources before any detrimental environmental impact, such as campaigning for the establishment of certain areas as natural parks or wilderness areas; or action is taken to draw attention to detrimental environmental impacts and solutions are suggested - for example, a certain species of fauna may be endangered by particular human activities and the NGO takes steps to protect this species. Conservation and protection of natural resources, especially of indigenous flora and fauna is a popular cause for citizen participation, particularly over local issues. However, NGOs range in their activities from local, to national to international in such issues and there are a number who employ professional staff and carry out research as well as those who campaign and publish to obtain public support.

H. Recreation

There are NGOs which come under this heading but which also carry out conservation activities or even community development. Recreation in natural surroundings would seem to be regarded as an excellent educational experience in that it develops appreciation for the natural environment and offers opportunities for practice in conservation. There are a number of youth NGOs who organise outdoor activities as much for the educational benefit as for the recreational and sometimes also for community development.

Certain NGOs which have a special interest in some kind of flora or fauna, for example those interested in birds, are likely to combine study with recreation, conservation and protection activities.

NGOs under this heading are likely to be voluntary citizens groups who inform and educate their members through outdoor activities, films, talks, periodicals, etc. Such groups are often organised to serve their members only rather than to take up issues publicly.

1.3 General trends in NGO activity in Developing Countries

A. Research

Outside of universities, pure research on the use of natural resources is not common. Research is most likely to be carried out in relation to the need for practical solutions

to economic and health development problems, for example, research is carried out on salt and fresh water food resources, medicinal plants, surface and ground water for industrial and agricultural development, water pollution, and the use of renewable resources for energy.

Among organisations specifically aimed to promote development, it is frequent to find that they are carrying on research while also implementing development projects. Examples of these NGOs will be mentioned under the heading 'C. Fostering Development'.

B. Seeking new approaches to, and new uses for Natural Resources

In developing countries, NGOs who are seeking new approaches to natural resources are usually doing so to foster development for peasants in an economically impoverished environment, and where greater use of local natural resources in an environmentally sound way would advance development. Three of the main areas in which NGOs are active in finding new approaches to natural resources are in appropriate technology, energy conversion, and human settlements. Reference to the chapters on these activities should be made for more details. Other areas are in the development of arid and semi-arid lands which includes wildlife ranching and agroforestry.

In the survey, innovative uses were made of the Tropical Chinampa plant, the water hyacinth and indigenous plants for medicines. All of the NGOs concerned with this kind of work employ staff to do much of it. Their activities include research as well as development, and they publish reports on their work as a way of interesting others who might use the information.

C. Fostering Development

The greatest proportion of environmental NGOs in developing countries fall under this heading. They usually concentrate on improving the economic circumstances and fulfilling basic needs of rural workers, the urban unemployed, and low income earners. It is common that such NGOs employ some staff but also common that they work either in close cooperation with local communities or rely on local participation. There are many such NGOs working in relation to development in arid and semi-arid lands, the improvement of water supply and quality for agricultural and human use, appropriate technology, energy, human settlements, afforestation, and agriculture. The funds for such NGOs are sometimes derived, at least in part, from the economic activities they generate. Research and publishing of reports, seminars, and consultancy services are often part of the development work.

D. Planning of development

Regional and urban planning are carried out by a number of professional bodies but much of it is done in close association with universities. The chapter on Human Settlements goes into this NGO activity more fully.

E. Education

NGOs are somewhat limited in their participation in education on the environment because many of them do not have the funds to provide more than an information service. However, there are NGOs providing education for the public or particular segments of the public such as women and youth, some of which employ staff and some rely entirely on voluntary assistance. A number of NGOs

provide environmental education (on conservation and protection of the environment in particular) for schools, and others provide it for members of the general public (usually on aspects related to development such as health and agriculture).

F. Provision of information on the use and misuse of Natural Resources.

Developing country NGOs experience many difficulties in evolving effective means of informing the general public or segments of it about the use and misuse of natural resources. Lack of funds for even the most simple reproduction equipment, payment for work done, and postage, etc., is one limitation. There are also often problems of expertise in knowledge of environmental problems, writing and speaking for public consumption (often in a second language) and there can be restrictions on the freedom to open up some topics for public debate. Despite these problems, there are several NGOs which have regular periodicals and irregular ones, one in the survey even publishes in a local language. There are also NGOs which give TV and radio talks, distribute leaflets and inform, by word of mouth, village and sub-urban people house to house.

G. Conservation and Protection

This area of NGO activities is most likely to be carried out in relation to development activities rather than for reasons of preserving the ecological balance, tourism and recreation, and the aesthetic and genetic value. For example, there is much concern in Latin America and the Indian sub-continent over the loss of indigenous forests through exploitation and the NGOs who are active to protect these forests or prevent further destruction are likely to relate their activities to the use of the forests for soil conservation, prevention of floods, and foliage for cattle, etc.; in Africa, the NGOs concerned with desertification usually centre their activities around the need to provide the people of such areas with their basic needs but in doing this, the conservation and protection of the environment is an integral part of development.

H. Monitoring Development

With most environmental NGO activity concentrating on fostering development, understandably there is much less activity in checking on how effective or destructive some aspects of it might be. Where development is such an important national aspiration for developing countries, the need to examine the environmental impact of development projects gets less attention from NGOs and where it does get attention the NGOs may be required to exercise a cautious approach in publicising or acting on any negative aspects. Where NGOs are monitoring the use of natural resources, it is usually in relation to industrial development and urban conglomerations and is an activity carried out by voluntary citizen groups.

2.1 EXAMPLES OF NGO ACTIVITY IN DEVELOPED COUNTRIES

A. Research

In aiming to undertake research in support of the public and private sector, with particular reference to industrial needs within the Province of British Columbia, *BC Research (0065)*, Vancouver, Canada, undertakes a wide variety

of research. Examples of the areas of their work are provision of bioassay services; algal assays; marine ecological studies; arctic environmental studies; environmental studies of coal mine development; socio-economic impact studies where there has been industrial development; development of activated sludge treatment for municipal and industrial wastes and of processes for detoxification of pulp and paper mill effluents; dust control and odour abatement. The organisation employs 124 staff and receives most of its revenue through the research it does under contract.

Although only established relatively recently (in 1973), the *Institute of Terrestrial Ecology* (0394), Cumbria, U.K., has a substantial amount of research and publications completed. Their overall objective is to respond to "the changing demands on the ecologist by studying ecological problems relevant to the reduction of economic margins in our national land management". They have researched for example - pollutants in estuarine waters; birds of prey and pollution; ecological effects of urbanisation and industrialisation on land; tree selection studies for revegetation of exposed sites and areas of dereliction; pilot studies on problems associated with foliar leaching and acid rain; forest management for energy; and carbon as a renewable resource.

The *New York Ocean Science Laboratory* (0477), New York, USA, carries out projects relevant to the improvement of production of fish including the establishment of a lobster hatchery; studies of water column, benthic and sediment chemistry and aquaculture of finfish and invertebrates. A research organisation in Denmark, *The Water Quality Institute* (0111), Horsholm, has projects which include the treatment of industrial waste water; recovery of heat, oil, fat or protein from water; and recycling of water.

Several organisations are carrying out research and education programmes concerning natural resources. The *International Ocean Institute* (0268), Msida, Malta, runs courses on the resources of the sea; publishes; carries out research and organises conferences. The *Department of Environmental Conservation, Helsinki University* (0120), Finland, holds courses in conservation, and also carries out research on a wide range of environmental problems. They research such issues as acid rain, mercury pollution, improved forestry techniques, the chemicalisation and motorisation of farming and forestry which is driving people away who functioned in an ecologically sound manner, and damming of rivers causing the heavy loss of fish. Research and education in the development, conservation and use of natural resources and in the improvement of the quality of the environment is carried out by *Resources for the Future* (0464), Washington DC, USA. Most of its studies are in the social sciences and are broadly concerned with the relationships of people to the natural environment. They publish books and a periodical which has a circulation of 20,000.

SCOPE (The Scientific Committee on Problems of the Environment) (0148), Paris, France, has a membership of 33 National members and 15 adhering International Scientific Unions and Committees. Established in 1969, it seeks to help scientists synthesize environmental information from diverse fields, identifying knowledge gaps and disseminating the results. The main emphasis has been on the following seven projects: biogeochemical cycles; dynamic changes and evolution of ecosystems; environmental aspects of human settlements; ecotoxicology; methods of simulation modelling of environmental systems; methods of environmental monitoring; methods of communication of environmental information; and

societal assessment and response.

The *Institute of Pyrenean Studies* (0332), Jaca, Spain, is concerned with a particular geographical region, the Pyreanean range and its environs. They carry out multi-disciplinary research on the region and publish their results.

An NGO with research centres in Europe and the USA, *The Battelle Memorial Institute* (0344), Geneva, Switzerland, is concerned with scientific research and development. A great deal of their work - although by no means all - is salt and fresh water research, using both field work and laboratory conditions. Research is carried out on water pollution from industrial and domestic wastes, water reclamation, and water purification. Remote sensing has been used, for example, to detect and map oil spills on surface water bodies. Mathematical models have been developed for ground and surface water studies which are applicable to specific environmental problems in the use of water. A successful method of water reclamation by removal of phosphate and ammonia has been developed.

B. New Approaches to, and new uses for Natural Resources

(i) New Approaches to the use of Natural Resources

An organisation concerned with development of low-impact, integrated living systems, *Amity Foundation* (0429), Eugene, USA, has completed extensive innovation work in using integrated systems in aquaculture, biological waste management and solar dwelling design. Their system includes a solar aquaculture greenhouse fish-raising facility used in breeding of tilapia, a fish garden which uses enriched water from the fish tanks, and a fish house incorporating a water re-use system in which water from the fish tanks is recycled and re-conditioned through biological filters.

Although the acquisition of land for wildlife sanctuaries, refuges, wilderness areas, nature preserves, wild and scenic rivers, is not now a new approach, it is worth mentioning here the work of the *National Audubon Society* (0470), New York USA, who were pioneers with this idea. They now protect wildlife and wilderness in more than 65 sanctuaries, they also conduct habitat management and other wildlife protection and perpetuation programmes. In many areas, where development threatens the ecological balance, the Society has been successful in supporting 'action priorities and long-term goals'. For example it has: urged administratively and through litigation, stricter controls on the use of pesticides and other toxic substances which may harm wildlife and threaten human health; questioned water resource programmes where they have been environmentally destructive; supported various specific instances of the need for air and water pollution control, strip mining control, reform of forestry practices and protection of grazing lands. They are concerned with educating the public and do this mainly through their publications. Land conservation is behind the very successful approach taken by the *Trust for Public Land (TPL)*, (0491), San Francisco, USA. They acquire and arrange for the preservation of open space to serve the needs of people. The open spaces they have acquired for public use include city parks, regional parks, additions to federal lands. They have been gifted areas of land, in fact, these gifts are their main means of support. As one approach to revitalisation of America's inner city areas, TPL has worked with the

National Urban Land Program to turn waste spaces to a benefit for the people living around them. With local residents doing the developing, these waste spaces have been turned into food producing community gardens and parks.

It is obvious that if water is to be supplied to those who need it - especially in developing countries - and if it is to be kept a renewable resource - especially in developed countries - then a variety of new approaches to its use will have to be found.

For a number of years, *The International Institute for Environment and Development* (0397), London, UK, has been concerned with mankind's need for enough clean water and its use "more effectively with minimum damage to people and the environment". They have carried out wide-ranging activities to help find new approaches to the use of water.

In December 1976, IIED convened an international symposium of experts to examine the possibility of 'Water for All'. The symposium identified four areas deserving increased priority: water supply, water for agriculture, conservation of water, and management of international river basins. Following the symposium, in a continued interest for 'Water for All', IIED published several reports on water, and have continued to consider a number of issues, including an assessment of the technological, institutional and managerial requirements for water for agriculture; water efficiency and conservation as a parallel with energy conservation; and the management of shared watercourses.

In a field that has generated a lot of emotion and conflict of opinions, whaling, the *Threshold Foundation* (0420), London, UK, has taken steps to get Japanese whaling industrial interests together with Japanese government officials and Japanese researchers to discuss whaling, not on moral or scientific grounds but on economic and political grounds. In the Foundation's opinion, the whaling industry would soon become uneconomic anyway and it is possible that Japanese interests could themselves initiate a new approach to whales on discussing this. The Threshold Foundation succeeded in holding a seminar among several leading Japanese in this field. They hoped that this would lead to a ten year moratorium on whaling. In the ten years they proposed that the Japanese whaling expertise and entire Japanese whaling fleet be used to help in carrying out the research necessary for an environmentally sound approach to whales after the ten year period. Sensitive discussions on this issue have begun and are continuing.

A group which began as an anti-uranium mining protest movement right at the site of some uranium mining, *Van Dieman's Gulf, Regional Ecology Centre* (0025), Humpty Doo, Australia, have evolved into a permanent settlement of people actively supporting all interests of conservation in the middle of a proposed national park, Kakadu. They are working towards understanding the ecology of their environment and supporting its conservation, at the same time as providing an educational centre for people of the area who are interested in the national park.

The *Australian Conservation Foundation* (0003), Hawthorn, is concerned with many issues related to the use of natural resources. They "make every effort to ensure that the air, land and waters of Australia are used with wisdom and foresight and that competing demands upon them are resolved in the best long-term interests of the nation". The work of the Foundation includes encouraging conservation education in schools; developing proposals to improve the environment; informing the public through publications and statements; campaigning to influence decisions which affect the

environment; and encouraging other conservation groups in their work. The Foundation is at present a substantial supporter of a new approach to conservation and employment, named 'Environmentalists for Full Employment' (Australia) (EFFE). EFFE seek to suggest alternative job-creating proposals to overcome the current unemployment, but which do not involve escalating energy consumption or environmental abuse. "A central theme of our argument will be that capital currently earmarked for environmentally harmful or resource wasteful projects such as uranium mining or increasing electricity generating capacity would provide much more social benefit, and many more jobs, if invested in alternative environmentally sound activities."

A number of NGOs aim to encourage greater self-sufficiency in food production and this is usually associated with the desire to grow food without the use of chemical insecticides, etc. *Ecology Action of the Midpeninsula* (0446), Palo Alto, USA, have developed what they call mini-agriculture. They use 'only renewable resources of fertilizers, no fossil-fuels, (and) a fraction of the water and land normally required to raise food'. The group produces research reports and other publications to promote this kind of agriculture. 'Research ... indicates an entire balanced diet can possibly be grown on as little as 2500 square feet per person in a 6-month growing season.' They compare this figure with those of other countries 'Using commercial agriculture techniques it takes approximately 32,300 square feet per person in India, 10,000 square feet in the USA and 4,800 square feet in Japan to grow similar diets'. The experimental work with these methods is carried out by four paid and five voluntary workers supported by about 260 members. The *International Society for Soilless Culture* (0287), Wageningen, Netherlands, promotes world-wide research and application of soilless culture. As far as possible, they provide information on detailed technical questions about hydroponics and they also organise conferences and publish the proceedings. The work of the organisation is carried out by volunteers and individual membership is 234 from 56 countries. Another NGO in this field is the *Hydroponic Advisory and Information Unit* (0393), Ickenham, U.K.. Hydroponics has some advantages for use in marginal and arid areas for food production and the service provided by this voluntary group includes information for various climatic and geographical regions. The *Biofarm Cooperative* (0345) Kleindietwil, Switzerland, promotes agro-biology among farmers by newsletters and the organisation of classes. They have 30 members with five salaried staff.

(ii) Innovative uses for Natural Resources

The jojoba (*Simmondsia chinensis*) is a plant endemic to the Sonoran Desert of Mexico and the United States. It has been used as a browse plant and widely planted as ornamental. Recently it has received attention because the liquid wax produced by the seeds is a possible substitute for sperm whale oil - a product derived from an endangered species.

According to the information material published by *Greenpeace Foundation of America* (0459), San Francisco, the oil from the jojoba seed has advantages over the similar product from sperm whales. Greenpeace is an organisation established to save whales, its headquarters are in Ontario, Canada, and they now have several branches throughout the world. Whales have been so greatly exploited for commercial reasons that many whale species are endangered. The information campaign carried out by Greenpeace, San Francisco, includes the supply of jojoba beans and technical information to gov-

ernment and non-government institutions who could use their products as a replacement for sperm oil. The technical information includes a list of "Potential Uses" which range over lubrication in industrial machinery, cosmetics, pharmaceuticals, cooking oil, polishing wax, protective coating on fruit, candles, animal feed substitute, mulch-soil amendment, and as an ornamental plant.

Opponents of nuclear development in Canada have found a unique 'device' allowing individuals to measure small quantities of radiation. The device is the spiderwort (*Tradescantia*), a small flowering plant native to North America. It has been found to be highly sensitive to low-level radiation, which causes mutations not only in the spiderwort, but also in other plants and animals. Unlike most other plants and animals, the spiderwort mutates quickly, within two weeks after exposure to radiation. Mutation is easily visible through a microscope since the plant changes colour - from blue to pink. Considerable research has been carried out on this plant in North America and Japan by individuals, governments and NGOs. Canadian NGOs are now informing the public on the use of the spiderwort to test for radiation. Two NGOs which have been researching on this plant are the *Laboratory of Genetics, Kyoto University (0242)*, Japan, and the Vancouver chapter of the *Canadian Coalition for Nuclear Responsibility (0066)*. NGOs which are informing the public about this discovery are *Pollution Probe*, and *Energy Probe*, both of Toronto, Canada (*0081*) and (*0074*).

The English organisation *The Wildlife Research Centre*, Chulmleigh, provides professional services in wildlife conservation management and research. At present, they are researching the use of wildlife resources for food, and for cultural and aesthetic values, on a sustained yield basis within an overall ecosystem management plan. This also includes development of wildlife husbandry methods for optimum productivity. Deer are farmed on an experimental and semi-commercial basis, and they have an interest in game ranching in Africa (*0423*).

The *Sierra Club (0485)*, Office of Environmental Affairs, New York, USA, in the interests of demonstrating the use of wild game instead of cattle as an alternative source of protein in arid areas, sponsored a field trip to a wildlife ranching scheme for delegates to the UN Desertification Conference. They have also arranged for the presentation of papers on game ranching and other environmental aspects of land use at a special seminar on desertification. In the Club's Tropical Forest Programme, their next area for action is a study of mangrove use and protection in Venezuela, Trinidad and Tobago, and Puerto Rico. The Sierra Club has both national and international programmes. Much of its work has been in supporting the creation and protection of national parks and wilderness areas. Over the past fifteen years, however, it has become involved increasingly in such issues as pollution control, energy, population, pesticides, transportation and regulation of private land use. They carry out their work through research, legislative lobbying and public education. They educate the public through conferences, publications, radio and television announcements, films, and advertisements.

It is with an interest in finding new sources of food, especially for developing countries, that the *International Institute for Environment and Development (0397)*, London, UK, has become concerned with the complex issues of harvesting marine resources for food. "Interest in the living resources of the Southern Oceans is not new since whales and seals have been hunted in the area for many years. Only recently has

attention been directed to a whole range of alternative stocks such as krill, squid, crabs, and fish. Krill is the most important since it has the potential to become the world's major fishery product." The programme of IIED is moving to a perspective phase and a number of options that could accommodate the interest of the international community are now being investigated.

In Hawaii, *The Oceanic Institute (0478)*, USA, has many practical projects in aquaculture. They are exploring the underwater environment for fish farming with cages and other facilities, and developing a new programme on the feasibility of marine shrimp farming in Hawaii. "These projects are in addition to the many research aspects of our long-term aquaculture program which is involved in responding to the demands of world hunger". Examples of other projects include a programme that is intended to conserve available brine shrimp cysts and ultimately provide a supply of cysts. This is in response to the scarcity of brine shrimp nauplii used to feed fish and crustacean larvae and its consequent great cost. The shortage threatens aquaculture development. They are continuing to develop culture methods for mullet and milkfish which graze low on food chains.

In taking a new approach to health there are some NGOs in developed countries interested in producing medicines from naturally occurring plants. This interest tends to be around the production by individuals of these medicines for their own consumption rather than for sale or community use as in some developing countries. A small group of citizens in rural England at Saffron Walden, probably exemplify this approach to primary health care among NGOs. They publish a bimonthly magazine '*Practical Self-Sufficiency*'. The magazine is a kind of teach-yourself manual with articles and diagrams on such subjects as plant growing, animal husbandry and the use of herbs and wild plants for food and medicine (0412).

In order to find protein substitutes for developing countries where malnutrition is prevalent, the *Laboratory of La Roquette (0143)*, France, have experimented with techniques of producing a blue algae rich in protein called 'spirulina'. The algae basin is integrated to the sanitary system and to a generator of bio-gas. They have installed one of these systems in an Indian village.

The general objective of the *Citizens' Association to Save the Environment (0070)*, Victoria, Canada, is to work for a quality of environment within a balanced ecosystem. Their activities include a great deal of education for the general public on changing life styles to conserve the environment. They make suggestions for greater self-sufficiency in activities which include food production and have published on the use of weeds and earth-worms to aid agriculture. All work is done voluntarily by the 175 members. Other activities include education on organic gardening, demonstrations of recycling, nutrition, use of sewage and domestic waste.

C. Correction of Development Patterns

The following examples are of NGOs which rely on political pressure and information supplied to convince the government and interested parties where development should be altered or stopped for environmental considerations. They usually rely on give and take between the NGOs' view and the view of the government and interested developers, where these views are conflicting. The issue of the use of natural resources is one which, throughout the developed world, continually brings NGOs and commercial developers

into disagreement. One of the most common areas of disagreement is where development interests would upset the ecological balance of natural parks or encroach on them, and similarly with the wilderness areas. There are numerous examples of NGOs which have taken up this issue in the case of particular local development projects and two such examples are mentioned below.

The Nature Conservation Society of South Australia (0020), Adelaide, works mainly to inform the government about the need to conserve the environment or protect it in the face of the development of regions of South Australia. 'The Society attempts to maintain on-going pressure for more enlightened attitudes backed up where necessary by appropriate legislation in the whole field of conservation'. They maintain the pressure by preparing numerous well-researched submissions, recommendations, suggestions, comments, and reports, mainly on development plans and actions as they affect natural resources. Much of this information is published. The Society has one paid staff member and more than 50 volunteers researching and writing, and several hundred interested members.

An NGO in Belgium, *Inter-Environment (0045)*, Brussels, has successfully campaigned on a number of issues to prevent or alter plans for development where they are environmentally inappropriate. They were successful, for example, in having a canal project rejected where the canal would have been detrimental to the beauty and productivity of some of the area through which it passed.

Another issue where NGOs have taken the step of trying to prevent the use of a natural resource is in the case of the use of uranium for nuclear power. In this case the concern is not so much over the use of uranium but more from the whole nature and risks involved in the production of nuclear power, and preventing the mining and sale of uranium is just one aspect. The examples mentioned below concerning this issue are Australian because of the intensity of NGO opposition to uranium mining there, the issue has been related to a number of others of importance, including that of Aboriginal Australian land rights.

The Environmental Council (0013), Darwin, Australia, researches and campaigns against uranium mining in the Northern Territory; they also have projects in solar energy. Through public meetings, leaflets, lectures, displays and demonstrations, the *Campaign Against Nuclear Energy (0008)*, Adelaide, Australia, have been successful in raising considerable support for their stand against uranium mining. They have been able to stimulate the formation of about 25 regional groups of people to support this issue in country towns, suburbs of the State capital, in work places and educational institutions. At present, they have 750 members which include two full-time and one part-time salaried employees.

The third major issue in developed country NGO movements on which they tend to take a preventative approach is that of halting the whaling industry. As with the issue of uranium mining, this issue has resulted in NGO actions which range from giving the public information through the mass media to attempting physical non-violent prevention of the killing of whales. Many NGOs, especially in North America, encourage the cessation of the whaling industry.

The Greenpeace Foundation (0515) Ontario, Canada, coordinates an international environmental movement based on the principle of direct non-violent confrontation over major environmental issues which include nuclear weapons testing, whaling and the slaughter of the baby harp seals. The ships of the Greenpeace ecological navy have confronted whalers in an attempt to prevent the killing off of these endangered species. The main office of Greenpeace is in Ontario, Canada, and the San Francisco office (0459), USA can serve as an example of the work of the organisation. They

organise support for the ecological navy with their activities, and also supply the mass media with information, publications, share information on substitutes for whale products, provide jojoba beans to those wanting to start production of this plant which can substitute various whale products, and raise funds.

Other groups also concerned with the issue, but who do not organise direct confrontations with whaling ships are, for example, the *Animal Protection Institute (0430)*, Sacramento, USA; *Project Jonah (0482)*, Bolinas, USA; *Friends of the Earth (0387)*, London, U.K.; *Animal Welfare Institute (0431)*, Washington, USA; *Centre Ecologique de Port Aux Saumons (0069)*, Rigaud, Canada; *International Whale Protection Committee (0464)*, Connecticut, USA; *The Cousteau Society (0442)*, New York, USA; *the World Wildlife Foundation (0336)*, and the *International Union for the Conservation of Nature and Natural Resources (0355)*, both of Morges, Switzerland. These NGOs are just examples of those interested in this issue. They have all produced publications and/or funds to publicise the issue, and FOE London has produced two Whale Campaign manuals to save whales by taking practical measures.

D. Planning of Development

NGOs concerned with planning of areas for their rational use commonly consist of laymen citizens and professionals. They can work for the planning of particular towns or areas, or for regions.

The Austrian Institute of Regional Planning (0029) Franz-Josefskai, aims to see wise planning of the region for land-use without disturbing the ecological balance and at the same time preserving the natural and built environment where necessary. They have both salaried and volunteer staff numbering almost 100. Areas in which they have provided information to the public, government and industry are many and include planning of road systems, consideration of tourism in certain areas, location of industry, country planning with particular reference to mountains, new methods of dividing town space, water supply, landscaping and natural areas.

A national body, the *Urban Land Institute (0492)* Washington, DC, USA, is a research and educational institute dedicated to improving the quality of land use planning and development. The Institute has as members both organisations and individuals, numbering 6,000. They carry out research and publish various periodicals and books.

A coordinating body for organisations concerned with rural planning is the *European Association of Institutions for Country Planning (0040)*, Brussels, Belgium. Their activities are carried out mainly through meetings and conferences; information about the work of members is shared through publications. Their areas of interest include land-use planning, housing, drainage, irrigation, development and protection of sites and their members tend to have interests in specific regions.

Professional organisations whose members work in fields associated with urban and rural planning, such as architects and landscape designers, carry out activities to support the protection and conservation of natural resources such as soil, forests, and naturally occurring flora and fauna. The *Swedish Association of Landscape Architects (0340)*, Stockholm, a voluntary organisation, through their periodicals, meetings and conferences, promote the development of horticulture, gardening, planning and protection of the landscape, and is an example

of such a professional organisation.

At the international level, the *International Union of Local Authorities* (0288), The Hague, Netherlands, has as members numerous bodies throughout the world which are concerned with planning the development of urban environments particularly. They hold conferences and training courses and publish several periodicals. Their work is relevant to both developing and developed countries.

In a rich agricultural area of Australia, the *Murray Valley Development League* (0018), Albury, Australia, uses various approaches to advocate an ecologically sound method of land and water use. The main objective of the League is maintenance, restoration and enhancement, of the quality of water in the Murray River System. Their concerns include urban development and proposals for minimising water table and salinity problems in the main irrigation districts.

Consultancy on regional planning is provided by *Agrar-und Hydrotechnik GmbH, Consulting Engineers* (0150), Essen, Federal Republic of Germany. The organisation does much work in developing countries on such aspects as land use and development planning, water resource development, and economisation of natural resources by waste recycling. Another consulting organisation, *S and L, Cities and Land, Consultants for Comprehensive Urban and Regional Planning* (0291), Rotterdam, Netherlands, gives regular planning advice to 140 municipalities and to various governmental and non-governmental organisations.

The *Institute for Environmental Research* (0031), Graz, Austria, is engaged in regional planning, development planning, recreational and touristic traffic planning. The Institute works with architects in a 'Team for Regional Planning' for communities.

Both research and teaching on regional and urban planning is carried out by the *Institute for National, Regional and Local Planning* (0351), Zurich, Switzerland, and the *Town and Country Planning Engineering Institute* (0238), Milan, Italy.

The *French Federation of the Societies of Protection of Nature* (0132), Rochefort, France, helps plan to protect natural areas, and wild animals, where development may destroy them. They have, for example, improved on the hunting legislation by participating in the formation of a coherent plan covering coastal, national and regional parks.

E. Education

A number of organisations which provide formal and non-formal education on the environment take as a major topic for study and research the use of water as a renewable natural resource. As an example, the *Institute for Environmental Education* (0461), Cleveland, USA, helps other organisations incorporate environmental educational activities into their established educational and research programmes. Their projects with students have provided maps of local waters, information on stream flow and suspended solids, stream biota, dissolved oxygen, temperature and pH; fecal and total coliform bacteria. Their guiding principles are that "the content is directed at actual problems in the community".

The *New York Ocean Science Laboratory* (0477), USA, is concerned with research and development in the ocean sciences, and they also run courses for students.

In the Netherlands, the *Institute for Environmental Education* (0285), Amsterdam, provides courses which cover all aspects of the environment related to nature conservation. *Environmental Control Studies*

(0106), Copenhagen, Denmark, are mainly interested in the biological aspect of environmental studies. They carry out research and provide training courses for students which include the conservation of natural resources, and the state and maintenance of nature reserves.

The *German Water Protection Union* (0153), Bonn, is concerned with all uses of water but especially with the use of water for sewerage waste. They have programmes to educate the public to the need to protect water, and investigate ways to purify water from sewerage. Part of their education programme involves the production of films, slides and the publishing of booklets on water, water economy and water protection.

A citizen action group concerned with water conservation is the *Chesapeake Bay Foundation* (0439), Annapolis, USA. "We do not believe in blind opposition to all 'progress', but in using education and science to maintain Chesapeake Bay and its tributaries as clean, pleasant and biologically productive areas for ourselves and generations to follow". They use a three-pronged approach to non-formal education of people in the area about the need for environmentally sound use of the Chesapeake Bay area: representation through the courts and political bodies to ensure the best legal provision is made and legal action is taken where necessary; carrying out programmes of land preservation in relation to the Bay, which includes land acquisition; and environmental education through field experience observation. The environmental education activities include field trips in estuarine ecology and waterfowl research for members and students, and canoe trips.

An Estuarine Studies project for high school students provides training, communication and special seminars to give students an appreciation of the ecology of the Bay. There is also an outdoor education centre suitable for work with primary as well as older students and facilities on an island to make it possible to conduct adult education in the outdoors. The Foundation has now begun teaching a course at University level.

The organisation has a paid staff of ten and a voluntary staff of five, the major portion of their funds coming from membership contributions from their 5,000 members, from gifts, special projects and grants.

Each year, hundreds of field studies courses, of about one week in duration, are provided to school children by the 179 paid staff of the *Field Studies Council* (0386), Shrewsbury, U.K. They aim to provide fieldwork and research experience in every branch of knowledge whose essential subject matter is out of doors, such as Botany, Ecology and Geography. Some of the courses are related to the formal education system and others are not.

The *Friends of the Forests of Heverlee and Meerdaal* (0043), Heverlee, Belgium, use natural areas to give school children experience in conservation. They are also used for youth and adults through exhibitions, exploration and forest classes.

Aiming to educate young people, especially those in schools, is the *German Environment-Action* (0152), Krefeld, Federal Republic of Germany.

Non-formal programmes in environmental education are run by the headquarters of the *International Youth Federation for Environmental Studies and Conservation* (0107), Skanderborg, Denmark. In addition to the

programmes, the Federation also organises visits, meetings and conferences and publishes literature to help youth become better informed and organised to protect the environment. The Federation also has groups in other countries which run their own environmental education courses, appropriate for the local situation. One such group is the *Udaipur Environmental Group* (0223), India, which this year organised a youth leaders training course which included field biological and ecological investigations. Another NGO which educates youth about the conservation of nature is the *Flemish Youth League for Environment and Nature* (0042), Antwerp, Belgium.

An NGO which specialises in protection of bird is the *Malta Ornithological Society* (0269), Valletta, has a policy of 'Conservation through Education'. They support this through attempts to obtain more adequate legislation to protect birds; research; publishing; display of posters; holding exhibitions, film shows, bird watching; radio interviews and programmes; lectures; tree planting; poster and slogan competitions; and providing support for the creation of nature reserves.

The main concern of the *Australian Underwater Federation* (0004), New Lambton, is underwater conservation. Their activities concentrate on research and education and include publications, planned educational courses on marine conservation, submissions to government on the need for a marine park, lobbying for a ban on scuba spearfishing in Queensland, liaison with government officials concerned with marine parks, collection of data on spearfishing efficiency and exploitation of giant clams, meetings and symposiums.

All matters of environmental protection concern the *Paul Emile Victor Group for the Defence of Man and his Environment* (0145), St. Cloud, France. They are particularly interested in the education of young people and provide books, periodicals, talks and exhibitions for this purpose. Issues they have campaigned for are, for example, improved water quality, protection of endangered species, preservation of indigenous plants and forest management. They have approximately 18,000 members and 7 salaried staff.

F. Provision of Information

The *Foundation for Environmental Conservation* (0350), Geneva, Switzerland, has various publications, including the journal 'Environmental Conservation'; holds international conferences; is preparing a multi-lingual glossary of environmental terms; carries out research projects; has a memorial lecture programme on topics of contemporary environmental concern; and raises funds.

The *Wildlife Management Institute* (0495), Washington DC, USA "is primarily concerned with renewable natural resources - wildlife, soils, rangelands, forests and water. The organisation's guiding principle is that these resources can be effectively managed to produce multiple benefits on a sustained basis for the public's benefit". Their approach is to provide "factual information to state and federal agencies, citizens groups and the general public", they also aid in the training of scientific resources managers by providing scholarships to deserving students and supporting the Cooperative Wildlife units at state universities. Their publications are of two kinds, those for specialists in the field of wildlife and those for the general public, and include pamphlets, booklets and books.

The *World Young Women's Christian Association* (0367), Geneva, Switzerland, has provided an information pack entitled 'The Responsible Use of Natural Resources'.

An unusual approach to informing the public about whales has been taken by *General Whale* (0456), Oakland, USA. They aim to provide accurate visual graphics of whales, dolphins and porpoises. They feel that by doing this, people will have some sense of these animals as living things and will be more likely to protect them. They are establishing a whale museum, supply published information and a whale packet especially designed for school children, and they have constructed life-sized whale models which children can see and touch, one model of which is light enough to be transported and used to stimulate interest in many different communities. In this last effort, they have had substantial support from another NGO - the *World Wildlife Fund* (0366), whose headquarters is in Morges, Switzerland.

Publicity on all aspects of the environment is attempted by the French group *Fight for Mankind* (0131), Paris, France. They use the mass media, organise conferences, and all kinds of public displays and talks. Recently they ran the *Great Ecological Cycle Tour* which consisted of a group of cyclists who rode from France to the USSR to publicise such issues as the need for clean air, savings of energy and a change of life style away from consumerism.

A magazine which is promoted by various environmental organisations in Italy, '*The Natural and Urban Environment*' (0237), Genoa, covers a multitude of environmental issues on which the public need to be informed. Some topics covered are soil conservation, afforestation, wildlife, urban planning, nuclear power and environmental management. Another Italian organisation providing information to the public is *Kronos 1991* (0236), Rome. It is concerned with seeing that development is not destructive of the environment and they campaign on such issues as afforestation and prevention of forest destruction for Christmas trees; automobile traffic and air pollution; environmental education in schools; creation of natural parks and protection of endangered species. The methods used to communicate information are through the organisation's regular periodical, other publications, TV and radio programmes and mass media, public demonstrations and rallies, demonstration projects such as a farm being used to demonstrate natural agricultural techniques. The two salaried staff serve a membership of about one thousand individuals.

G. Conservation and Protection

The *Amalgamated Conservation Society* (0064), Victoria, Canada, is a citizen organisation concerned with conservation of fish, game and



natural resources. They have constructed a dam to provide rearing waters for salmon, and incubation boxes for salmon, spawning channels and rearing areas. Also they have carried out daily salmon fry feeding on two rivers during May to October.

Another NGO in Canada, the *Conservation Council of Ontario* (0072), Toronto, aims to promote the welfare of all persons by encouraging the conservation, restoration and best use of natural resources of soil and water, and the life sustained thereby. Their interest in water conservation has led them to present briefs and submissions concerning pollution of the Great Lakes and revisions to the Drainage Act; they are concerned that the broad effects of planning should be considered, taking account of all aspects of the environment affected. They have been involved in land use planning, management, proposals for the Great Lakes, protection of endangered species and natural areas. With a staff of four and the voluntary support of more than 400 members, they act through letters, submissions, public campaigns, personal contact and publications in attempting to educate the public and influence policy makers.

Another NGO concerned with the creation and protection of natural areas is the *Portuguese Centre for Wildlife Study and Protection* (0328), Oporto. With support from the Centre, the government established one of two proposed natural areas they advocated. Through press campaigns they have drawn attention to the destruction of the littoral due to the advancement of the sea and to the fluvial deposits at the lower section of several rivers. In their attempts to influence public opinion and policy makers, the Centre organises study tours to natural areas, informative talks, and films for the general public and in schools; they also publish newsletters and a journal.

A national organisation, *The Society for Promotion of Nature Conservation* (0416), Lincoln, U.K., is concerned with all aspects of nature conservation and derives much of its strength from the forty Nature Conservation Trusts for which it is the national association. Early in its achievements was the acquisition of eight important nature reserves and its present activities include making representations on legislation and government policies affecting the environment, publishing educational material, organising conferences and seminars, and continuing to establish nature reserves.

Protection of natural areas for tourism is a specific interest of the *Swiss Alpine Club* (0359), Bern, Switzerland. In a number of regions where tourism is substantial, industrial development is also progressing on a large scale and the club is concerned to see that neither tourism nor development damages the natural environment. The Finnish Archipelago is also an area where the natural resources attract development, agriculture and fishing mainly, and tourism. The Finnish NGO *Nature and Environment Protection* (0122), Helsinki, is concerned to see sound management of land and water, the preservation of national park areas, regulation of building permits and the recreational use of motor vehicles, education of the public and provision of information to local inhabitants. Their 1978 campaign is connected to that of two other NGOs, the *International Union for the Conservation of Nature and Natural Resources* (0355) and the *World Wildlife Fund* (0366) called 'Let the Seas Live'.

Protection of endangered species and birds interest many NGOs, some of which have been mentioned under their headings such as those interested in the protection of marine mammals. The following are other examples: the *Icelandic Society for the Protection of Birds* (0172), Reykjavik; *League for the Study and Protection of Birds* (0260), Luxembourg; *French League for Protection of Birds* (0133), Paris. They

have often been established for years, for example, the oldest established of those mentioned above is the French organisation started in 1912. They usually publish information material, support the establishment and maintenance of nature reserves, take an interest in legislation which affects birds, and carry out observations on bird types, and numbers, and collect scientific information.

The specific interest in protection of endangered species is usually a more recent one, for example the *Committee for the Defense of Animals in Peril* (0346), Geneva, Switzerland, was formed in 1969. However, there are many well-established NGOs who have an interest in endangered species as well as other issues, and that have worked in this area for a long time. One of the best known examples of such an organisation is the *International Union for Conservation of Nature and Natural Resources* (0355), Morges, Switzerland. IUCN is a union of sovereign states, government agencies and non-government agencies joined together to promote the wise use of natural resources throughout the world, it was founded in 1948. Through its education and information programmes, the Union seeks to increase public awareness both of the value of natural resources and of their vulnerability. They aim to help nations take the fullest advantage of their natural resources in ways that can be sustained for the benefit of future generations. Among its many achievements IUCN drafted the 1973 Agreement on the conservation of Polar Bears; promoted and provided a first draft of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (for which it now provides secretariat services), co-sponsored the Convention on Wetlands of International Importance, especially as water fowl habitat, drafted a Convention on Conservation in the South Pacific and a Convention for the Protection of Migratory Species and more recently drafted 'A World Conservation Strategy'.

The *Animal Protection Institute* (0430), Sacramento, and the *Animal Welfare Institute* (0431), Washington DC, USA, are two other examples of NGOs concerned with endangered species of animals.

On the island of Malta, development which includes buildings, roads and the tourist industry is causing the loss of indigenous flora and fauna. The *Natural History Society of Malta* (0270), Sliema, has published a 'Country Code for the Maltese Islands' to educate people about this trend and help curb it. They have also established a natural area for the transplanting and cultivation of indigenous flora.

In their concern that 'good farming practices make a significant contribution to maintaining and improving the environment', the *International Federation of Agricultural Producers* (0139), Paris, France, see that their members are informed about sound farming practices especially to avoid soil erosion, over-grazing and other misuses of land. It publishes several periodicals and other material.

The *Committee for the Defence of Natural Areas* (0127), Marseille, France, conducts campaigns to conserve and protect the areas around Marseille whose flora and fauna are threatened by development, especially by tourism. The committee presses its case for each issue by campaigns in the press and discussions with the administration.

The development of legislation to protect natural resources is the main work of the *Japan Centre for Human Environmental Problems* (0239), Tokyo, Japan. They have also organised conferences to assist international cooperation in

this field and publish a journal.

H. Recreation

Many NGOs provide recreational activities but usually as part of an environmental education programme. Invariably the contact with nature has the effect of making the members more appreciative of the need to conserve and preserve natural resources. The aims of the Sierra Club give an indication of this approach. The *Sierra Club* (0486), San Francisco, USA, works to restore the quality of the natural environment and to maintain the integrity of ecosystems. Educating the public to understand and support these objectives is a basic part of the Club's programme. All are invited to participate in its activities, which include programmes to "study, explore, and enjoy wildlands". The Sierra Club's chapters and groups organise excursions which range from local to international and include such activities as hiking, backpacking, car camping, cycling, canoeing, rock and peak climbing, skiing, photography and natural science field outings.

The *Swiss Ramblers' Association* (0362), Riehen/Bale, Switzerland, supports the making of paths for pedestrian tourism and at the same time conserves the natural environment through which the paths pass.

In Cyprus, the *Association of Nature Friends and Mountaineers* (0104), Limassol, organises excursions and outings to promote love of nature and natural beauty. They have supported campaigns to conserve and protect the environment during which they attempt to reach the public with information through the press. Another organisation concerned with mountain excursions is the *Swiss Alpine Club* (0359), Bern, Switzerland. They have a very detailed programme of excursions, hikes, etc., throughout the year for their 60,000 members who are served by four salaried staff. In support of conservation and protection of the Alpine region, the Club monitors all activities which relate to tourism and recreation, such as the construction of funicular railways and ski lifts, construction of buildings and aviation. The collective membership of the *International Working Group for Sport and Leisure Facilities* (0157), Cologne, Federal Republic of Germany, is concerned to assist in planning so that recreation, games and sports facilities are provided for all communities. Their activities include school planning, parks and landscaping, traffic and the establishment of integrated centres for education, health care, sports and leisure.

With the aim of educating youth about science and technology, the *National Scientific and Technological Association for Youth* (0144), Paris, France, organises summer camps for its 25,000 members. They also publish a periodical with articles having simple explanations and illustrations from science and technology. The experiences of the children are designed to arouse their curiosity about the natural environment and stimulate study of it.

The *World Scout Bureau* (0385), Geneva, Switzerland, has many publications, seminars and other activities to encourage scouts to actively participate in development, at the same time preserving and protecting the environment. They have recently produced a series of simply written and clearly illustrated booklets on appropriate technology and environmental health, particularly suitable for developing countries. The scouts are encouraged to use their activities for community service in very many practical ways such as in the building of water wells, education of village people in safe ways to store food and dispose of waste, energy production from wind and solar

sources and water collection and storage. They have also produced educational material on wildlife and ecology.

A continuous attempt to educate the public about the need to protect birds, especially those which are endangered species, is carried on by the *Malta Ornithological Society* (0269), Valletta, with approximately 400 members. The biggest threat to Maltese bird life is from the widespread shooting of birds for sport. In an attempt to discourage this practice the Society publishes informational material - prints and posters, stickers, etc. - and organises a clay-pigeon shooting competition. They suggest appropriate legislation to protect birds, monitor the enforcement of bird protection regulations, remove stuffed birds from schools and help in setting up a nature reserve.

2.2 EXAMPLES OF NGO ACTIVITIES IN DEVELOPING COUNTRIES

A. Research

In the Caribbean, saltwater research of all kinds is carried out by the *Bermuda Biological Station for Research Inc.* (0049), St. George. It is an independent research facility available to individuals and institutions which also conducts courses for students. Their researchers have publications on various aspects of fish life and one of their main concerns is oil pollution. Aquaculture in freshwater is researched by the *Uganda Freshwater Fisheries Research Organisation* (0377), Jinja, Uganda. They also provide advice on resource evaluation and exploitation, conservation and pollution problems.

The *National Council for Scientific Research* (0506), Lusaka, Zambia, monitors and assesses the quality of natural water bodies, sewage and industrial effluents, and determines their effects on the general environment. This organisation is involved with planning for industry in relation to the availability of surface and ground water; provides information and consultancy services, and works with government officials to improve the monitoring of water pollution.

Wastewater treatment and water quality research is carried out extensively by the *Asian Institute of Technology* (0371), Bangkok, Thailand. Other research is on, for example, processes for water softening; a survey of air, water and noise quality standards and legislation in Asia; the use of a potable water solar still; slow filters made from locally available material and applied to village water supplies; and biogas production.

In the Netherlands, the *Institute of Cultural and Social Studies* (0284), University of Leiden, have recently published the results of in-depth research on the Jonglei Canal in the Sudan. The Canal will divert Nile water which would otherwise evaporate in the marshes, and then make the water available for irrigation in developing the region. It is a major hydrological undertaking. The Jonglei has been the subject of much research and interest, including a project by the *Environment Liaison Centre*, (0247), Nairobi, Kenya. The reports published by both NGOs attempt to picture the ecosystem and culture of the region around the Canal as an integrated system, and to look at the impact of the Canal development on this system.

The *International Commission on Irrigation and Drainage* (0203), New Delhi, India, has member national committees throughout the world which

are concerned with various aspects of water management, including irrigation, drainage, flood control and river training. They carry out research, publish information and hold meetings and conferences. Their approach concerns engineering, economic, social and environmental aspects of water management.

The *Tropical Science Centre* (0103), San Jose, Costa Rica, provides assistance in the rational exploitation of forest resources through their research. The Centre contracts directly to undertake teaching, research and field survey work in the complementary fields of basic and applied ecology, and technical management, and conservation of renewable natural resources. They have, for example, advised private corporations on ecologically sound land development, crop selection, forestry and wildlife management in tropical and sub-tropical environments and have carried out basic ecological research in tropical forest environments.

Soil research is carried out by the *Association of Agronomists of the State of Sao Paulo* (0056), and *Agromax Agriculture and Stock Ltd.* (0055), both of Sao Paulo, Brazil.

With their main interest in energy, the *Projects Development Institute (PRODA)* (0305), Enugu, Nigeria, carries out research on coal to obtain a smokeless solid fuel for domestic use. They also develop cheap solar-heaters and solar-driers for agricultural products to be manufactured locally.

The *Birbal Sahni Institute of Palaeobotany* (0179) Lucknow, India, carries out studies on plant fossils throwing light on the correlation of coal and oil bearing strata and the evolutionary history of vegetation.

Concern for human health and protection of crops from diseases is the basis for research carried out by the *Bose Research Institute* (0181), Calcutta, India. In relation to human health, they stated: "The flora of the state is undergoing a rapid change due to rapid industrialisation and increase of population." These changed circumstances are "seriously disturbing the ecological balance. The change has a profound effect on the health of the people". Their research has produced pollination calendars for areas where thousands suffer from upper respiratory tract allergies; they have recorded and isolated aeroallergens around the year; and have prepared antigens from spores and pollen grains which are used in hospitals and clinics. They also do research into biological agents which affect crops. Among a range of interests in arid zone flora held by *Geobios* (0192), Jodhpur, India, they carry out research on medicinal plants of the desert and publish information on this and other aspects of their ecological work in a monthly magazine.

B. New approaches to, and new uses for Natural Resources

With a twenty-five year history of involvement in arid and semi-arid land activities, largely through its committee on Arid Lands and Committee on Desert and Arid Zone Research, the *American Association for the Advancement of Science (AAAS)* (0427) Washington DC, USA, has supported at international level the development of an integrated scientific perspective on the development of these zones. They co-sponsored with other national and regional associations, a four-day seminar in Nairobi preceding the UN Desertification Conference. As a result of the seminar a set of interrelated critical indicators was agreed on as an aid to planners, managers, decision-makers and funding sources in determining effective policies to meet basic needs of people and their environment in arid and semi-arid lands. A handbook of

these indicators was also published, and several development project sites were chosen including some in developing countries, to test and validate the set of indicators.

Providing international coordination and a networking function for all researches on desertification, the *International Geographic Union* (0016) set up the *Working Group on Desertification in and around Arid Lands* (0026), Kensington, Australia. Their meetings, publications, etc., concern desertification in all parts of the world, not just developing countries.

In an attempt to halt the destruction of the low rainfall grasslands of Africa from the introduction of foreign plants and animals leading to desertification, a wildlife ranching scheme has been established at Athi River, Kenya, known as *Wildlife Ranching and Research* (0256). The ranch has the whole variety of indigenous herbivores and both they and the flora are left completely in the natural state. In this way the delicate ecological balance of the area remains. Should this experiment prove economical and environmentally sound, it is expected that its ideas can be adapted by the nomadic and semi-nomadic peoples of the low rainfall areas. The results so far are promising in that the meat produced from the ranch animals is of the highest quality and 95-99% lean. There are none of the saturated fats found in beef and there appear to be adequate markets for the sale of game meat. The indigenous herbivores are completely adapted to the environment and their ranching does not result in any of the destruction accompanying the ranching of cattle.

The practice of agroforestry cannot be regarded as new, however recognition of its importance is very recent, especially as regards its potential for optimising land-use in the developing countries of the tropics.

"Agroforestry has been defined as a sustainable land management system which increases the overall yield of the land, combines the production of crops (including tree crops) and forest plants and/or animals simultaneously or sequentially, on the same unit of land, and applies management practices that are compatible with the cultural practices of the local population". (King, K.E.S. and Chandler, M.T., 'The Wasted Lands', 1978. International Council for Research in Agroforestry, Nairobi.)

The primary aims of agroforestry are the production of food and the conservation and rehabilitation of the soil resources needed for future food production. A new NGO has been set up with its headquarters in Nairobi, to promote agroforestry for the benefit of peoples of developing countries - *International Council for Research in Agroforestry* (0249). They have programmes to assemble, analyse and publish research and information on such topics as multi-purpose trees, fodder trees, fuelwood production, and soil studies. Research projects will each include a training component for local personnel to assist in overcoming the need for trained manpower in this area.

The water hyacinth has until recently been regarded solely as a pest, spreading quickly, blocking water courses and endangering marine life. *Agromax Agriculture and Cattle Ltd.* (0055), Sao Paulo, Brazil, is carrying out research on the use of dried water hyacinth and coconut fibres for soil cover in their work on soil erosion and conservation. A German NGO, *The Research Institute for International Techno-Economic Cooperation* (0158), Aachen, does development related research which has included examination of methods for con-

trolling the water hyacinth and using it to best advantage. It seeks to find methods appropriate to developing countries and emphasizes technique for converting it for feed, food, fertilizer, and energy production. In the Philippines, *The Institute for Small Scale Industries* (0321), Quezon City, is researching the use of the water hyacinth as a primary raw material in pollution control and lake rehabilitation, textile yarn, currency paper, food, feed ingredient and others.

The *Ecodevelopment Centre* (0275), Mexico, has a programme to make swamps productive by growing in them the *Tropical Chinampa* plant. They have successfully transferred the plant from the Mexican Valley to the swamp zones of the South East of Mexico which are under-utilised. Ultimately, they hope to be able to use the chinampa for cattle feed and to be able to breed fish in the waters planted with chinampa. They have pilot projects on this at present. In another programme to study the ecotechniques applicable in agricultural development in all regions of Latin America, the farming of aquatic and terrestrial wild fauna is being researched with a kind of prawn (*Machobranchium americanum*) and the tapir (*Tapirus* spp.).

The use of indigenous plants for medicines is being encouraged with the support of the *South Pacific Appropriate Technology Foundation* (0316) Boroko, Papua New Guinea. The Foundation, jointly with the office of Village Development, produces a newsletter 'Yumi Kirapim' which includes information on the activities of local people producing medicines from locally available plants and using them for treatment. The Foundation has many activities both practical and educational in developing and spreading technologies appropriate to the peoples of the South Pacific.

C. Fostering Development

(i) Africa

Increasingly there is an interest among NGOs in the economic development of arid and semi-arid regions of developing countries and in improved land-use practices in places affected by drought. In the words of SAMDENE, which is reported on below, "arid and semi-arid ecosystems are fragile and of low stability and resilience. An environmental management policy can be successful only if formulated with a basic understanding of the full complexity of the natural

education and training in the evaluation of the impact of land use patterns. The research is directed to finding information relevant to the obtaining of 'ecological equilibrium and societal harmony' as the region develops. Those working for SAMDENE projects are the paid staff and graduate research assistants, they carry out research, foster interdisciplinary programmes and develop inter-institutional connections between ecologists, provide research facilities and train post-graduate students.

At the level of the local farmer, the *Kenya Catholic Secretariat* (0350), Nairobi, works to improve the living conditions for those in areas liable to drought or affected by it. They have stimulated and supported small projects on irrigation, damming and building of water wells and on rational land utilisation.

Research and development work in various parts of Africa including the Sahel, is carried on by the *Pan African Institute for Development* (0062) Douala, Cameroun. They promote innovation and disseminate the results of their activities, such as research, seminars, and field work, through their publications. The 120 salaried staff work with villagers and low-income urban dwellers.

The *African Society for Research and Development* (0497), Ouagadougou, Upper Volta, is also involved in research and development, monitoring development projects and providing policy and planning options for developers.

The *Kweneng Rural Development Association* (0052) Molepolole, Botswana, is involved extensively in afforestation for community development. The Association is run by an elected Board of local people with Government representation. They are involved in a great variety of development activities but because much of their area of operation is adjacent to, or actually in, the Kalahari, their concern is with the arid and semi-arid environment. The forestry unit is involved in practical work, not only in establishing trees (of which they have planted 100,000 over the last 5 years) but also in soil erosion control, water conservation, extension work to make the community 'environment conscious' and experimental work in conservation techniques, scrub enrichment, micro-irrigation, and many similar activities. They also sell thousands of trees each year to local people for planting in the area. They aim to further agricultural development without damage to the ecosystem.

A youth organisation which carries out practical projects to encourage participation in development is *The Prince Mphahlele's Award* (0259) Maseru, Lesotho. Their projects include activities to conserve soil, build latrines with local people and provide potable water to rural villages.

A survey of 50 small villages in Southern Botswana pointed to the most pressing problem being the need for water. *The Pelegano Village Industries* (0054), Gaborone, Botswana, have therefore included improved water supply for small communities, water catchment, filtration, and simple technology for water extraction from boreholes and wells in their village development programmes. Individual projects are organised under the following programme topics - food, water, cooking/homecraft, shelter, entry into the cash economy, education, transport. Projects are carried out by the local people with cooperation where necessary, from skilled staff and volunteers, paid staff number thirty. All the projects require practical application of ideas by the people themselves to improve the conditions of rural life.



ecosystems to be developed." *Systems Analysis of Mediterranean Desert Ecosystems of Northern Egypt* (SAMDENE) (0119), Alexandria, U.A.R., is involved in interdisciplinary ecological research,

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In Zambia, *The Biology Department of the University of Zambia (0505)*, Lusaka, works with other groups on an integrated development project for the Kafue Basin. The research embraces wildlife, vegetation and all aspects of the environment as well as the human population and their domestic stock. Their activities are mainly of a research and education nature.

Education, training and mobilisation of youth for active participation in farming, fishing and viable economic ventures is the work of the *Ghana Young Farmers (0160)*, Cape Coast. They have carried out school construction projects, launched pilot agricultural schemes and have supported effective food preparation and distribution. Another youth organisation involved in community development is the *Voluntary Work-camps Association of Nigeria (0306)*, Lagos. They have worked in the rural areas to improve agriculture, and construct community buildings using local materials. Utilisation of plentiful natural resources for building construction is encouraged by both these organisations.

(ii) Asia

In Asia there is a great deal of community development work done by NGOs to use natural resources for the benefit of the village people. In most cases such NGOs will carry out projects which have the provision of potable water to village people as a major component in conjunction with the supply of water for irrigation. They tend to use voluntary unpaid public participation as the main source of labour for projects - self-help - and may have paid staff qualified in aspects of community development. *Action for Agricultural Renewal in Maharashtra, (0173)*, Poona, India, mainly works to provide drinking water bore wells for village people, they also provide advice on soil conservation and carry out afforestation projects. They rely on a small paid staff and a larger group of voluntary workers. A coordinating body for 24 community development organisations in Bihar State is the *Bihar Association of Voluntary Agencies (0178)*, Patna, India. Their member agencies have sunk thousands of tube wells in drought prone areas; built more than 25,000 large diameter surface percolation wells in hilly tracts where tube wells cannot be installed; also they have provided open bores and built more than 44,000 houses for displaced persons. Courses have been provided to farmers which include information on rational irrigation methods and soil conservation. The assistance provided by the agencies is in the form of education courses, funding, stimulation and practical assistance, and expert advice. Other Indian organisations with similar community development interests are the *Christian Fellowship Hospital (0186)*, Oddanchatram, and the *Gondwana Welfare Centre (0193)*, Tamia Village. In other countries, there is the *Sri Lanka Women's Conference (0335)* Colombo, and the *Bangladesh Volunteer Service (0035)*, Dacca.

The *Natural Resources Development Cooperative Society Ltd. (0214)*, Hyderabad, India, provides a consultancy service to farmers and industrialists concerning the location of ground water and water management, and the location and exploitation of minerals. In advising on the exploitation of natural resources they assess the environmental impact and are concerned to prevent pollution of ground water by effluents from industry.

Aid to the small farmers of Nepal is provided by *Development and Consulting Services (0278)*, Butwal, Nepal, in the form of hydroelectric schemes, building and installing of small water turbines and bio-gas plants. The salaried staff, numbering 21, also carry out research on appropri-

ate technology and publish reports. Areas for both industrial and agricultural development are researched by *The Center for Natural Resource Management and Environment Studies (0229)*, Bogor, Indonesia. The Center has carried out a number of research studies on the patterns of ecological constraints and resource use dynamics having implications for industrial and agricultural development in coastal areas, and on water quality. Examples of their research interests are: a study of a coastal swampland in Sumatra planned for settlement and agricultural exploitation. "The swampland development is one of the most significant environmental transformations likely to take place in Indonesia. It is one of the world's major experiments in marginal land utilisation and a classic case for creating resource and environment strategies."

Cutting of trees for firewood is one of the main causes of the depletion of forest cover in developing countries and an example of NGO activities to combat this is the *Millions of Trees Clubs (0212)*, Tumkur, India. They attempt to make villages self-sufficient in fire-wood by helping poor marginal farmers to set up plant nurseries where they can raise saplings at nominal cost and earn an additional source of income. They have participated in the planting of more than one million saplings. Particular varieties of trees with short growth spans are planted in great number to provide firewood as well as trees needing more time to grow.

(iii) Latin America and the Caribbean

One of the projects of the *Peruvian Association of Sanitary and Environmental Engineering (0320)* Lima, Peru, will improve the environment of San Juan by the use of recycled water from the city for irrigation of infertile land turning it into a green space for the city. This project will also reduce the polluted water being poured into the ocean causing marine pollution. Through its member organisations, another project concerns the transfer of water from the Mantaro River to the Santa Eulalia/Rimac river basin. The water will be used for hydro-electricity, irrigation and drinking water.

Situated in an area where the need for more farmland has led to "great deforestation, soil erosion, and of late a shortage of firewood", the *Choqui Experimental Station (0166)*, Quezaltenango, Guatemala, has projects in appropriate technology, agriculture and health. With a total of 13 voluntary unpaid members and the support of local people they have developed mud cooking stoves, taught soil conservation, terracing, composting, etc. and they train "health promoters" for primary health care in their communities. Another Guatemalan NGO whose work concerns appropriate technology, the *Mesoamerican Centre for Appropriate Technology (CEMAT) (0165)*, Guatemala, has projects ranging over the use of local materials for building, medicinal plants, small scale industry, food and nutrition, biogas, solar and wind energy. They publish reports on their work.

Aiming to develop the Amazon region of Ecuador through environmentally sound agriculture, the *Centre for Integral Training for Agriculture and Husbandry (CECAI) (0112)*, Puyo, Ecuador, promotes such activities as training in orchid growing, nutrition, and environmental conservation. These activities are carried out by three paid staff and volunteers in such a way that the culture of the indigenous people is respected.

The *Institute of Urban Housing (0116)*, San Salvador, El Salvador, researches and develops the use of plentiful local natural resources for building construction.

(iv) Developed Country NGOs

The projects of *Oxfam* (0409), Oxford, U.K., funded in developing countries are diverse, but most could be regarded as community development projects in health, social development and agriculture carried out by local people with the help of Oxfam funds.

D. Planning of Development

Self-help housing programmes are aided by the *Korean Institute of Architects* (0257), Seoul, Republic of Korea, who are able to give professional advice. They also have seminars, periodicals and other publications which provide information on urban planning. Similar activities are carried out by the *Study Group of Strategy on Planning and Design* (0231), Bandung, Indonesia, who have a particular interest in housing development.

The *Department of Architecture and Regional Planning* (0188), Indian Institute of Technology, Kharagpur, carries out research and teaching in city planning, regional planning and architecture. Research and planning consultancy is offered by the *Research and Planned Development Systems Inc.* (0323), Quezon City, Philippines. They work in urban and regional planning, and carry out some specialist planning in such areas as squatter relocation, community facilities, urban renewal.

In Latin America the *Interamerican Planning Society* (0096), Bogota, Colombia, serves as an example of an organisation with voluntary membership (unpaid and numbering 2,320) which carries out research and publishes papers on regional and urban planning.

E. Education

The examples below are NGOs whose work is all or mainly carried on by salaried employees although they may also receive support and assistance from unpaid volunteers. Their educational activities may be carried out in the formal education system or outside of it.

With its aim being to conserve wildlife, the *World Wildlife Fund Malaysia* (0266), Kuala Lumpur, carries out a programme of conservation education in schools using a mobile education unit. They have produced films and audio-visual programmes for schools; and reports and management plans for new national parks and sanctuaries. Their activities are carried out mainly by five salaried staff and ten voluntary unpaid assistants. Programmes in primary schools of Costa Rica are run by *Friends of Nature: Interamerican Association for the Study and Protection of Nature* (0101), Guadalupe, they also organise programmes with rural youth and have a particular interest in soil and water conservation. They have two salaried employees and 146 members.

Also carrying out activities with school children but as part of the formal education system, to the extent of developing curricula, is the *Science Education Programme for Africa* (SEPA) (0161), Accra, Ghana. They actively include environmental education in the science curricula they are developing.

In the belief that both public and higher education should be provided on natural resource use, ecosystems and environmental quality, the *Ecological Society of Thailand* (0373), Bangkok, has cooperated in seminars, research, course planning, meetings, etc. Their work is carried out voluntarily by the 85 members, and they produce a newsletter in Thai having a circulation of 500. Also in higher education, the *Ecology Programme Group*

(0264), Kuala Lumpur, is assisting in developing an ecology degree programme and they carry out research on tropical rain forests and associated drainage ecosystems. With 45 members they produce a quarterly ecology magazine and organise meetings and conferences.

Examples are given below of NGOs whose activities are mainly carried out by unpaid volunteers and whose educational activities are in the main non-formal.

The *Voluntary Health Association of India* (0226), New Delhi, is an NGO which works to improve the health of people through their own participation and with the use of local resources. Among a range of concerns is community health and this includes the need for clean drinking water and sanitation systems. They hold workshops, seminars, correspondence courses, etc., and provide education for professional health workers as well as for village communities.

The *Association of Public Health Officers* (0246), Nairobi, Kenya, educates the public on aspects of health such as the need for clean water and proper sanitation in relation to cholera, the necessity of eating only inspected meat, improvements of trade premises in rural and urban areas.

The *Environmental Protection Society* (0258), Kuwait, has as one objective the preservation of natural and marine resources. They carry out public education campaigns and encourage the participation of youth by using their research as part of their information programmes; hold conferences and seminars; prepare amendments to legislation and try to influence acceptance by the government.

The *National Association of Manufacturers* (0098), Medellin, Colombia, are concerned with pollution and water contamination, waste conversion, among other interests. They provide information to their members through several periodical publications, books and documents. Their library is open to their members, affiliated organisations, university personnel and teachers.

Outside the formal education system and aiming to raise the awareness of environment and development issues among villagers of West Africa, is the *Centre for Economic and Social Studies of West Africa* (0428), Bobo-Dioulasso, Upper Volta. They hold seminars for rural adults to stimulate and inform them of rural development.

The *Environment Training Programme (ENDA)* (0329), Dakar, Senegal, is concerned with all issues related to environment and development in developing countries. Their projects include some on development in arid and semi-arid regions of Africa, appropriate technology, agriculture, planning rural arid regions of Africa, economics and tourism. ENDA organises training sessions, undertakes research, provides consultative services and publishes various documents and periodicals in the general area of environment and development.

To promote the conservation of the wildlife resources of Africa, the *African Wildlife Leadership Foundation* (0245), Nairobi, Kenya, provides opportunities for education designed to train African leadership in technical and wildlife management skills. They have established a College of African Wildlife Management in Tanzania, supported conservation education in schools through other organisations; carried out research and provided support for wildlife reserves. They publish periodicals and educational booklets. The work of the organisation is carried out by nine salaried staff.

Citizen groups providing environmental education are often involved in encouraging rational land-

use policies especially where the pressure of population needing the land is causing environmental damage. The example given below is of an NGO on a small island where the need for land is great.

The *Mauritius Society for Environment and Conservation* (0273), Phoenix. They mainly provide environmental education to youth involved in farming and ensure that soil conservation is practised for environmentally sound land use. Through talks, seminars, competitions, demonstrations and publicity in the mass media, they serve an educational purpose. They have also planted over 10,000 trees.

F. Provision of Information

In Latin America, the *Ecological Group of the University of Tolima* (0094), Colombia, started in the University but now is composed of about 60 active members from the University and from other occupational groups outside the University. They have various kinds of environmental education and information programmes for the general public and children. Their information campaigns include door-to-door visits by youths reaching about 40,000 homes every year; radio programmes for rural areas; the monthly publication of a periodical 'SOS Ecologico' (circulation 4,000), and leaflets; they also issue press releases.

Examples of other periodicals produced by NGOs in Latin America are for example the bi-monthly 'Boletin' by the *Costa Rican Association for the Conservation of Nature* (ASCONA) (0099), San Jose (circulation 250); 'Amigos de la naturaleza', published quarterly by the *Inter-american Association for Studies in Defence of the Human Environment* (0102), Guadalupe, Costa Rica (circulation - English 150, Spanish 250); and 'Educacion Popular' published by the *Institute for Research on Culture and Popular Education* (0050), Oruro, Bolivia.

In Asia there are several NGOs producing periodicals which provide environmental information. The *Centre of Science for Villages* (0185), New Delhi, produces a 'Science for Villages' which has articles related to rural development, including aspects of appropriate technology, primary health care, and employment in small-scale industries. Other Indian periodicals are, for example, 'Pollution Control', published monthly by the *Indian Association for Water Pollution Control* (0198), Nagpur, and 'Himalaya Man and Nature' published monthly by the *Himalaya Seva Sangh* (0197), New Delhi.

A very well developed communication system has been developed by the *Consumers Association of Penang* (0263), Malaysia, which provides numerous press releases yearly, a newspaper 'Utusan Konsumer', house to house campaigning, public talks, meetings, seminars and exhibitions. The *Environmental Protection Society* (0265), also of Malaysia, publishes 'Alam Sekitar' quarterly with a circulation of 1,000.

In Africa, the *Environment Training Programme* (ENDA) (0329), Dakar, Senegal, publishes 'African Environment', a quarterly publication and an occasional-papers series; other African examples are the *Wildlife Clubs of Kenya's* (0255), magazine published three times a year, 'Komba' with a circulation of 4,000; and 'Afrolit News' published quarterly by the *Afrolit Society* (0244), Nairobi, Kenya (circulation 600).

In the Caribbean there is the 'Caribbean Conservation News' by the *Caribbean Conservation Association* (0036), Barbados. In the Pacific, the *Fiji National Youth Council* (0118), publishes 'Youth Action' as a summary of youth development activities.

G. Conservation and Protection

A consultancy service directed at local farmers is provided by the *Centre for Himalayan Resources Investigation and Survey* (0184), Rishikesh, India. The Centre works with local farmers providing encouragement and advice on the use of conservation methods in farming, providing protection to local plants and trees, afforestation, protecting water sources from pollution and in taking an active interest in the maintenance of the ecological balance of the region. In support of this work they have surveyed such natural resources as the forests, water, and grasslands. Both voluntary and salaried personnel are working for the Centre and they rely on students and youth for work done in distant villages.

An organisation whose research and survey work is carried out entirely by salaried personnel is the *Research Centre on Terrestrial Biological Resources* (0001), Algiers, Algeria. They are researching and mapping arid zone ecosystems. Ecological research is also carried out by the Rio Palenque Science Centre (0114), Quito, Ecuador, who have made inventories of native flora and fauna in certain areas; and by the *La Salle Natural Science Society* (0502), Caracas, Venezuela.

Protection and conservation of all wildlife in their local area is the concern of the *High Range Game Preservation Association* (0196), Munnar, India. The 48 members of the organisation assist in the management of a national park.

There is widespread concern for the preservation of forests in India particularly in the north. There are a number of NGOs there which are groups of concerned citizens from the area who have direct experience of the flooding and loss of soil from the over-exploitation of the forests and are taking action against further deterioration of the situation. The *Kasturba Ladies Upliftment Organisation* (0206), India, is one such organisation. They aim to protect forests from over-exploitation by educating women on the need to conserve trees rather than destroy them for fodder and fuel. Besides talks, they lobby government officials, plant trees, and carry out public demonstrations. The *Indore Eco Society* (0200), Indore, India, is another NGO which concentrates on afforestation. They have public education campaigns regarding the need for protection of trees, give advice on care and planting of trees, and conduct tree planting. The work of the organisation is done by the 110 voluntary unpaid members.

In Sri Lanka, the *Wildlife and Nature Protection Society* (0336), Colombo, is an example of an NGO which is concerned to protect flora and fauna of all kinds including those living in or near water. They are interested in the extension and creation of marine sanctuaries and parks; coastal protection particularly the prevention of coral reef mining and the destruction of mangrove swamps; monitoring of agricultural practices used in catchment areas; and protection of endangered species including fish, reptiles and butterflies. Their activities are carried out by working closely with the government officials responsible, through mass awareness campaigns to draw attention to the need for improvement; research and publications; the formation of clubs in schools and support for this by films, distribution of literature, and conducting of essay and drawing competitions.

H. Monitoring development

The *Visakha Consumers Council* (0225), Visakhapatnam, India, is concerned with potable water in the city - its supply and quality; availability of ground water - and water pollution from industry. They

carry out their own research from observation and local sources, draw public attention to problems and solutions, hold meetings and lobby the government on providing protective legislation. An integrated approach to water use is taken by the *Social Welfare Guidance Foundation Surakarta (0230)*, Indonesia, who are concerned with all aspects of their local community which need improvement. They work to improve domestic water supply and quality in drinking and sanitation, and have carried out research on the social and ecological effects of an irrigation project. The *National Consumers Association of Nigeria (0303)* Calabar, raises public awareness where the environment is being affected adversely, helps motivate farmers to increase food production and provides education for the public on health care and water supplies. Raising public awareness on all kinds of environmental protection is done by the *Environmental Protection Society (0265)*, Petaling Jaya, Malaysia. It has a particular interest in the pollution of rivers from industrial waste and carried out a survey of the water pollution of one of the main rivers of Malaya. They also act by drawing attention, both public and official, to the need for environmental protection through their publications and through the mass media, by lobbying decision-makers in the government, holding seminars and carrying out research.

A citizen organisation, the *Environment Protection Society (0058)*, Campinas, Brazil, has among its concerns the water used to carry discharge from industry and domestic locations in the city. They hold meetings and conferences and encourage interest in environmental protection through contact with schools.

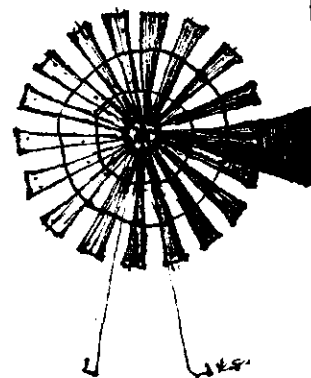
The *Environment Foundation (0276)*, Mexico, publishes information on all aspects of environmental conservation and points to the need for protection where necessary in their magazine 'Medio Ambiente'. They are especially interested in protection, management, preservation and conservation of flora and fauna species threatened with extinction.

Mainly an environmental education organisation, the *Ecological Group of the University of Tolima (0094)*, Ibagué, Colombia, researches and publishes information on environmental degradation from industrial and agricultural activities.

In areas being heavily exploited, causing destruction of the littoral and of the human environment, the *Society for the Defence of the Brazilian Coast (0059)*, São Paulo, is actively campaigning to defend these areas. The 53 voluntary unpaid members campaigned publicly using posters and information leaflets, took legal proceedings and attempted to create special protected areas to stop future destruction.

ENVIRONMENTALLY SOUND and APPROPRIATE TECHNOLOGY

FOUR



1.1 GENERAL STATEMENT

NGO policies in the field of appropriate technology follow different trends and meet diverse requirements, according to whether they are generated for or adapted to developing countries or used in the context of developed ones. The kind of appropriate technologies selected depends on various interrelated factors, such as the pattern of development and also the specific needs of the people of the region. NGOs dealing with appropriate technology can be classified in three main categories:-

- National NGOs located in developed countries, involved in the generation or promotion of appropriate technology in their own countries in order to deal with internal problems raised as a consequence of their present pattern of development, the use and unrestricted application of technology, affluent life styles and increasing awareness of the so-called "1985 Technological Crisis"* that leads to important changes in attitudes and values.
- International NGOs based in developed countries, with activities oriented "to initiate, encourage, support and conduct research into the problems of developing regions of the world, and into the means for applying and adapting scientific, technical and other knowledge to the economic and social advancement of those regions" (IDRC, Canada, Informative Brochure).
- National NGOs located in developing countries, strengthening the capacity of the developing world to meet some of their own technological needs, through the generation of appropriate technology, the improvement of traditional techniques, the transfer and adaptation of technology according to the characteristics and specific requirements of recipient countries.

1.21 General Trends in NGO Involvement in All Countries

Two broad orientations can be appreciated in the approach of NGOs to technology:

1.211 A sector-oriented approach, where technology is considered in relation to specific problems (agricultural tools, energy-saving stoves, local building materials, etc.) or well-delineated areas of concern. In this context, appropriate technology is developed or adapted to meet the requirements of a particular sector of the economy such as industry, agriculture, health, etc., emphasizing the use of small-scale technologies that permit savings of raw materials and energy; that are low waste producers and designed to work in harmony with the environment.

NGO activities within this approach cover almost all the sectors of the economy and have special rele-

vance to the following:

A. Agriculture and Food Production:

Developed countries orient their efforts to research and promotion of organic fertilizers and organic methods of cultivation; food contamination and additives in food processing; yield improvement through improvements of plant varieties; research and soil-fertility improvement. Besides research NGOs, there are other NGOs involved in the dissemination of their findings, especially those related to agrobiology and the introduction on the market of agricultural products obtained by organic methods.

Developing country NGOs are particularly active in this field, covering a wide range of concerns, such as treatment of wastes and residues, research on the genetic potential for high-yielding varieties; research on appropriate agricultural technology for the humid tropics and drylands; agricultural tools; techniques for storage and food conservation; organic fertilizers and compost preparation; small scale farming, labour intensive methods; and utilization of local resources.

Innovative uses of marine and water resources are undertaken by research-oriented NGOs. Their areas of interest include: aquaculture, polyculture; utilization of marine seaweeds and algae ponds; management of sea resources.

B. Building and architectural design:

In this field, developed countries are especially concerned with technology oriented to energy conservation and the introduction of renewable sources of energy in architectural design, and with technology for urban waste treatment and sanitation; autonomous house designs, based on recycling techniques as well as on the utilization of integrated systems.

Developing countries are more oriented to research and to carry out projects in low-cost housing, utilization of local building materials; self-help construction programmes stressing labour-intensive modalities; basic infrastructure, etc. Great emphasis is being given to development of "village level technology", aiming to provide household amenities.

C. Transportation:

Activities in this field are particularly stressed by developed country NGOs, concerned with urban congestion, land use, and energy-saving transportation.

D. Health:

Appropriate technology for health is given greater emphasis by developing country NGOs. Their main concerns are prevention and control of diseases; communicable diseases and sanit-

* USA Government Printing Office. The 1985 Technological Crisis. The social effect of technology in growth and its implications for the future.

ation. An important innovation is the demystification of medical technology which involves the community in primary health care, provides training for "community-based doctors". Research into indigenous and traditional systems of medicine is being upgraded in some countries, particularly in India and Sri Lanka.

E. Energy Technology:

Developing and developed country NGOs are engaged in renewable energy utilization, but with differing orientations. In developing countries, bio-gas and solar energy sources research is stressed, mainly for domestic purposes such as heating, cooking and minor agricultural production or small scale industry. In developed countries energy research for domestic purposes is of far less importance than research oriented to obtaining high-grade energy, adequate for big-scale industrial processes.

F. Industry:

Developed country NGOs are interested in low energy technology, and technology which permits a saving on raw materials. Several research projects are being carried out on waste treatment, recycling and treatment of organic pollutants. Small-scale industry and rural crafts are projects stressed by NGOs in developing regions. Innovative use of some natural resources, such as the utilization of the wastes for construction materials; the use of the water hyacinth for animal food, textile yarn and other purposes; research on technologies for the sugar industry, cotton spinning industry, pottery industry, etc., are among the main concerns of developing country NGOs.

1.212 Technology within an integrated development approach.

This second trend emphasises technology as playing a vital role in the achievement of development targets. Development strategies which include an appropriate technology approach represent a change in relation to conventional approaches, in the sense that they are oriented to an endogenous and self-reliant process of development.

Basic to this approach is the emphasis on the choice of technologies having the following characteristics: utilization of energy and resources in such a manner that opportunities for future generations are not diminished; the use of technology which serves to satisfy basic human needs; items produced are in the interest of the majority of people; local culture, traditions and social organizations are not detrimentally affected; local initiative and participation is utilized; the people who are served by the technology should become the controllers of it; transferred technology is adapted by recipient people for their needs; the technology promotes decentralization, innovativeness and creativity. NGOs following the Gandhian tradition and the Shumacher influence, are particularly active in the implementation of an appropriate technology approach, having important and numerous projects following the above-mentioned statement.

The Sarvodaya Movement in Sri Lanka also orients technology in this direction.

Sri Lanka and Papua New Guinea have NGOs dealing with technology within an integrated development approach: *Lanka Jatika Sarvodaya Shramadana Sangamaya*, (0333) Moratuwa, Sri Lanka, *S. Pacific Appropriate Technology Foundation* (0316), Boroko, and the *Melanesian Council of Churches* (0312), Boroko, Papua New Guinea. In Africa, it is possible to

mention the *Environment Training Programme* (0329) (ENDA), Dakar, Senegal, using technology according to an ecodevelopment approach.

2.1 EXAMPLES OF NGO ACTIVITIES

A. Agriculture and Food Production

Perhaps the fact that 85% of the population of Africa, 70% of South Asia and 50% of Latin America lives in rural areas, explains the enormous interest of NGOs throughout the world to develop appropriate technology for rural development and agricultural production.

The activity of NGOs in this field covers a wider range of topics, including all aspects of agricultural research such as tools and implements; appropriate technology for wells; modern scientific methods for crop selection, fertilizers, irrigation and drainage; cattle improvements, farm machinery and rural development programmes. The emphasis differs, depending on whether the NGO orientation is to meet needs of the developing world for agricultural development in industrialized countries.

Developed Countries

1) Chemical fertilizers and food production

The *Bio Dynamic Agricultural Association* (0007), Powell Town, Australia, intends, through research and operational projects, to bring compact soils and those otherwise lowered in their fertility and biological activity, to a sound biological activity. The organisation presents demonstration projects to farmers about how to produce economically, without polluting. *Small Earth* (0292), Bostel, Netherlands, is a national organisation promoting organic farming. They educate the public and attempt to influence legislative and policy decisions on alternative sources of energy, providing courses on that subject for young people.

The conservation of soils and the use of organic fertilizers and organic methods of cultivation, is also promoted at the informational level by the *Soil Association of New Zealand* (0300), Christchurch, New Zealand. The *International Federation of Organic Agriculture Movements* (IFOAM) (0140), Ste-Genevieve-des-Bois France, is a transnational organization carrying out research, operational projects and providing information on agricultural activity viable from an ecological, social and biological point of view.

Effects of herbicides, fungicides and pesticides, additives in food and food contamination, is a topic, among other studies, carried out by the *International Union of Pure and Applied Chemistry* (IUPAC) (0401), Oxford, U.K. *Bio-farm Cooperative* (0345), Kleindietwil, Switzerland is a commercial institution promoting agro-biology. They are concerned with motivation and advancement of agro-biology and introducing in the market products cultivated according to biological methods.

The *Soil Association* (0417), Suffolk, U.K. promotes organic husbandry as the best means of building up soil fertility to produce better crops of higher nutritional value. Publications produced include those on such topics as organic methods, organic farming and garden compost. The organisation has an international scope. Other functions are the development of week-long courses on biological husbandry, attended by 1,000 students.

The *International Federation of Agricultural Producers* (0039), Paris, France, has a large number of member organisations throughout the world covering many individual farmers. They aim to encourage efficiency in agricultural production through sound farming practices and proper land use. The organisation has produced an "IFAP" Handbook, as well as a quarterly magazine "World Agriculture" and "Farming for Development".

ii) Yield Improvement

Farm and Food Society (0385), London, U.K. is a national and international organization engaged in combining the best traditional methods with the wise use of technology in order to establish a rational, ecological agriculture, utilising natural resources to best advantage and avoiding the use of chemical fertilizers and sprays.

The *European Association for Research on Plant Breeding* (0283), Wageningen, Netherlands, is an international research organisation oriented to promoting scientific and technical cooperation in the field of plant breeding, in order to contribute to the progress of agricultural production. The "Eucarpia" gene bank committee coordinates the work of the European gene banks, which facilitates the evaluation of the available plant genetic material and the use of a standardized documentation system.

Ecology Action of Midpeninsula (0448), Palo Alto, U.S.A., is involved in researching mini-agricultural projects oriented to test the yields of the "biodynamic French intensive Method of Horticulture". Deep spading, bed planting and composting are the keys to it. "Preliminary findings show this method can increase vegetable yields by 400% on the average in comparison with present mechanized techniques used in USA", affirm the organisation. Fertilization is provided by renewable materials: compost, manure, wood ashes, bone meal and legumes. This method can be productive on a small manual scale. As it uses little water, it can be especially valuable in arid areas of the world, or can provide a self-sufficient livelihood in regions of high unemployment. The organisation was founded in 1971 and acts within local, national and international scope.

Practical Self-Sufficiency (0412), Essex, U.K., is involved in the promotion of organic farming through their magazine "Practical Self-Sufficiency" which is oriented to advise about how to make the best use of resources in order to get more independence in food production. The magazine provides practical know-how on how to grow fruit and vegetables organically, and how to harvest, store and preserve them; how to prepare by-products, gathering herbs and plants for food and medicine; animal husbandry, etc. They are also interested in the utilization of small scale energy alternatives and in the development of crafts and home skills.

iii) Agroforestry

The *International Tree Crops Institute* (0400), Braintree, U.K., aims to promote tree farming for dry or very wet developing countries, using tree crops as supplementary grazing for animals. The Institute is also engaged on a global survey of small scale village tree planting schemes.

iv) Agricultural Engineering

The *International Commission of Agricultural Engineering* (0136), Paris, France, is involved in the development and dissemination of science and technology in the field of agricultural engineering. Currently they organize meetings, seminars and conferences on this matter. Among

their concerns is the scientific organisation of work in the agricultural field; agricultural mechanisation, rural electrification and construction; and agricultural management of water and soils. The organisation is participating in the preparation of themes proposed by the 9th International Congress of Rural Engineering on the following subjects: structure and building materials exposed to animals; building systems and equipment for milk production; use of electricity to purify manure and to suppress odours; appraisal of the usefulness of by-products. Other areas of interest are related to energy and water conserving measures in the irrigation systems; the utilisation of solar energy in agriculture, for heating farms and for drying agricultural products; and the efficient utilisation of fuels in mechanised agricultural works. The Conference is going to be held at the Michigan State University, U.S.A., in July 1979.

v) Aquaculture

Some NGOs are active in aquaculture development. For instance, the *New York Ocean Science Laboratory* (0477), U.S.A., is carrying out a project on aquaculture of finfish and invertebrates. *Amity Foundation* (0429), Eugene, U.S.A., completed a solar greenhouse fish-raising facility, used in breeding of tilapia in recirculating, biological systems. The idea is to develop feeds which can be economically processed by the farmer; terrestrial crops and aquatic plants being used to feed several varieties of fish together (Polyculture). The different feeding habits of the various species results in a better utilisation of the feed. The gardens are downhill from the fish tanks. Enriched water is drained from the greenhouse to a holding pool and irrigation water for the garden is drained from this pool. Using gravity and enriched water from the fish tanks prevents energy waste, adding fertilizers and overcoming the need to pump the water. The *Water Quality Institute* (0111), Hoersholm, Denmark, is carrying out aquaculture using power plant cooling water and/or domestic waste-water. The institute is also carrying out research on the use of algal ponds for removal of nutrients from waste-water.

The *European Centre for Environmental Problems* (0129), (CEPEM), Paris, France, has a project to research new ways of utilisation of marine seaweeds and is developing studies on the management of sea resources.

The *Laboratory of La Rochette* (0143), Saint Bauzille de Putois, France, is an international research organisation whose work concerns developing countries. They are involved in the local cultivation of a blue algae rich in protein (spirulina) in order to procure a protein supplement in the diet of villages suffering from malnutrition. The algae basin is integrated to the sanitary system and to a generator of biogas, ensuring health for the population and fuel for cooking as well as good quality manure.

Developing Countries

The main NGO activities in the agricultural field are:-

i) Irrigation

Research activity related to the study of agro-systems in the framework of watershed management is the concern of the *Centre of Natural Resources Management and Environmental Studies* (0229), Bogor, Indonesia.

Kishore Bharati (0209), Hozhangabad, India is concerned with research and implementation of programmes based on mass education, both formal and non-formal. Projects of farming and small cottage industry and appropriate village level technology, are among the achievements of the organisation. For example, appropriate technology for wells; scientific modern crops selection; use of fertilizers and the introduction of two crops through the development of the irrigation potential. As a method of work, they encourage cooperation and community living and functioning.

ii) Fertilizers and Pesticides

The utilization of appropriate farming technology including the use of methane gas and sludge in small scale farming, is the field of the *Kenya National Farmers Union (KNFU)* (0251), Nakuru, Kenya. *Tunnel Company* (0254), Fort Tenant, another Kenyan organisation, is carrying out projects on design, manufacture and marketing of four types of methane plants, including the Batch type of organic wastes. They are interested in producing and selling methane plants for converting farm and plantation wastes into rich fertilizers. They are also concerned with the design and manufacture of Hutchinson solar units in varying sizes and capacities.

The *Mesoamerican Centre for Appropriate Technology* (0165), (CEMAT), Guatemala, has a vast programme on Appropriate Technology. In relation to agriculture, the organisation is carrying out programmes to produce organic fertilizers by recycling; methods for compost preparation and programmes on appropriate technology for rural development. The *National Federation of Young Farmers Clubs* (0274), Phoenix, Mauritius, is a citizen action group involved in tasks and demonstrations on the rational use of chemicals, fertilizers, pesticides, herbicides and in the use and benefits of compost waste. They were also involved in a fruit tree plantation campaign distributing more than 10,000 trees to the village people. The organisation has 3,500 members. Research on pesticides in imported and local foods has been done by the *Papua New Guinea University of Technology* (0314), Lae.

Agromax Agriculture and Stock Limited (0055), Sao Paulo, Brazil, is a technical and scientific organisation that, among other activities, has programmes for control of soil erosion. One method used is through the utilization of humus, turfs, calcareous and mulch on subsoils and eroded areas. The organisation is studying the utilisation of the dry residues of water hyacinth as soil cover. They are also using coconut fibre residues, for the fertilization of soil.

Kisan Bharati Mewad (0200), Jagudan, India, is a local NGO involved in spreading education and the Gandhian ideology promoting a scientific attitude in relation to agriculture and village life. A scientific agriculture project using manure was completed successfully after an exhibition of wheat production using manure; yields increased by about 60%.

iii) Tropical agriculture:

There is a great interest in NGO research activity concerning this subject in the developing world. Among NGOs, the *New Guinea Biological Foundation* (0313), Port Moresby, Papua New Guinea, has explored the possibility of assisting the inhabitants of Papua New Guinea by research on the agricultural potentialities of the humid tropics. Experimental plantations of fruit orchards demonstrated that yields can be improved considerably. The *International Centre of Tropical Agriculture (CIAT)* (0097), Cali, Colombia, intends to generate and deliver improved technology which would contribute to increased production, productivity, and the quality of specific basic food commodities in the tropics, principally in Latin America

and Caribbean countries. The organisation is carrying out research on improvement of bean crops, to produce the most efficient cassava plant varieties that incorporate resistance or tolerate important insects and diseases. Additionally, work is done for the improvement of low-cost effective root storage methods.

Rice scientists are working in collaboration with the *International Rice Research Institute* (0322), Philippines, to improve rice varieties, adapting the technology to the Latin American situation. A similar project is being done on maize and wheat. The Genetic Research Unit of the Institute is working with germplasm materials of beans, cassava and tropical forages; the activities of that unit ensure that valuable, and sometimes rare, genetic resources will be protected and at the same time utilized throughout the world. The Institute also is carrying out research on animal production, especially on the validation and transfer of technology to increase beef production, primarily through improved year around forage production in the acid infertile soils of tropical America. These infertile soils represent about 300 million hectares which are currently underutilized. Research on swine activities has also been done, identifying and adapting local protein and energy sources to swine feeding, in an efficient and economical way.

Tropical Scientific Centre (TSC) (0103), San Jose, Costa Rica, is a scientific organisation undertaking training activities, research and field surveying on ecology and technical management and conservation of renewable natural resources. Among its accomplishments are: basic ecological research on tropical forest environments and a feasibility study on crop diversification in the coffee producing region of Honduras.

The Tropical Pesticide Research Institute (TPRI) (0369), Arusha, Tanzania, is carrying out research in the development of equipment, spraying techniques, and methods for the control of pests of agricultural crops and pests of medical and veterinary importance, including studies in toxicology and environmental pollution.

The Integrated Training Centre for Pastaza Peasants (0113), Puyo, Ecuador, promotes agriculture and stockbreeding development, adapted to the equatorial Amazonian environment. The project is based on experimental farming, where technology is tested in order to get an improved agricultural model. The next step is the dissemination of the agricultural technology appropriate to the environment and the local market. Among the achievements of these kinds of models there is a long-term plan for a traditional cropping introducing alternative subsistence farming products, such as banana, yam, maize and chinese potatoes. Another project alternated sugar cane cultivation with leguminous plants, aiming to fix nitrogen and to produce human and animal food during the time that the sugar cane productivity started to decrease. A third improved agricultural model was for poor lands, with an integrated approach to fruit production and small stock raising, using cow manure for trees and planting grass of the type *Axonopus Sooparius* for cow feeding.

iv) Yield Improvement

International Crops Research Institute for the Semi Arid Tropics (ICRISAT) (0204), Hyderabad, India, serves as a world centre for the improvement of genetic potential for grain yields and nutritional quality of sorghum, other grains and ground nuts. Development of farming systems

to help increase and stabilise agricultural production and identify socio-economic and other constraints on agricultural development, are also activities of ICRISAT.

The International Rice and Research Institute (0382) Manila, Philippines, has fifteen types of nurseries containing varieties and breeding lines originating from thirty-nine countries. Two important aspects, from the environmental point of view, are genetic evaluation and utilization, and varietal improvement programmes. They breed rice varieties resistant to pests, diseases, soil problems, etc., and minimizing the use of chemicals. Secondly, a Crop and Soil Management Programme, investigates the fate of fertilizer used and crop residues. The impacts or potential impacts of the new rice technology is studied both at the farm level and at the level of government policy for increasing rice production.

Improvements in agriculture resulting in high yields to farmers in several districts of Sri Lanka is an achievement of the *Organisation for Industrial, Spiritual and Cultural Advancement (OISCA) (0334)*, Colombo, Sri Lanka. The organisation carries out projects through paddy model farms, a paddy and cash project, and uses the help of experts in scientific paddy growing.

v) Rural Development

Agricultural concerns in developing countries sometimes are integrated in comprehensive projects in rural development, aiming to improve village and rural life.

The African Society for Development Studies (0497), Ouagadougou, Upper Volta, is a regional research organisation working through operational projects, technical assistance, training and provision of information, providing expertise in rural development issues. Their main concern is the search for a technology appropriate to the scarce resources of the region, and to the abundant availability of labour, mainly non-qualified labour. For that purpose, the organisation created a section specialized in the promotion of intermediate technology, adapted to the rural environment, *The Research and Applied Techniques Service (SRAT) (0497)*. The aim is to improve the productivity of traditional methods; utilization of local materials; appropriateness to the economical resources of the population and easily utilized by local people. They are connected with *Vita (0493)*, Maryland, U.S.A., and *Oxfam International (0409)*, London, U.K.. Small-scale agricultural projects are often encouraged by NGOs as in the case of *Yampela Didiman Association (0318)*, Banz, Papua New Guinea, who try to disseminate appropriate technology materials, to involve people in cultural and social development, improve nutrition and to achieve self-sufficiency in food production.

The Choqui Experimental Station (0186), Quezaltenango, Guatemala, is especially oriented to work with Indian people in rural areas. Their efforts are related both to saving energy and to providing tools that low-income people can afford. The work system of the Choqui Experimental Station integrates field work with laboratory research, looking for a specific problem and trying to get the technological solution; disseminating their findings and educating people on its application; training people for the promotion of the device and finally, testing and reaction of the users as a feed-back to improve the previous model. A "Lorena Stove" type was designed, using the experience of Africa and India, and introducing the modifications appropriate to the Guatemalan rural areas. This stove makes a more efficient use of firewood; can use other fuels, such as maize stalks, sawdust and wood shavings; is cheap in its construction; and utilizes local

materials and tools. Another project is oriented to food preservation using solar drying. The researchers tried several alternatives in order to get a model that did not require skilled labour for its construction. A Methane gas digester is an on-going project that is being adapted to the environmental conditions and cultural patterns of the region. Soil conservation is another field where the Choqui Experimental Station is developing techniques for organic fertilizer production and utilization. The organisation provides expertise on the analysis of agricultural soils, the production of rhizobium and soil samples and has programmes on soil fertilization. They have started the publication of a booklet on their research activities as well as publishing technical bulletins.

vi) Dry-land Farming:

Systems Analysis of Mediterranean Desert Ecosystems of Northern Egypt (0115), Alexandria, Egypt, is an academic research and scientific organisation, broadening the base of ecological information on the northwestern coastal zone of Egypt. Among several issues related to arid and semi-arid ecosystems, they are involved in the adaptation of methods used by the Bedouins for dry farming and grazing rotation.

Geobios (0192), Jodhpur, India, is an academic research and scientific organisation of national and international scope. They are involved in ecological research mainly in relation to improvement of saline areas and saline areas utilization; arid zones weeds and their control; medicinal plants of the desert; and food plants in arid zones. Among their publications is 'Environment and seed germination of Indian Plants'. They publish also a magazine 'Geobios'.

Mochudi Farmers (0053), Mochudi, Botswana, is basically interested in agricultural research in the area of dryland farming, using the Mochudi Toolbar - "the machine which can do everything". The name is considered fitting since almost any type of cultivation tool can be attached to it and it can also be used for transporting drums of water. By removing some of the components from the toolbar, a walking model can be had which allows inter-row cultivation when crops are taller. It is possible to construct the implement with relatively simple equipment - hack saw, drill press and welder. Other devices are a seed farming wheel which presses the seed before covering, thereby increasing germination; a removable lister share which permits planting in a shallow furrow. Additionally, the Mochudi Farmer's Brigade has conducted variety trials with a number of crops and has made important introductions to Botswana testing bird resistant sorghums, introducing soybeans and "dwarf hybrid castor varieties".

vii) Food Processing Technology:

The Central Food Technological Research Institute (0182), Mysore, India, is primarily concerned with development and application of technology for various post-harvest operations. It also develops food products from indigenous raw materials and provides assistance to industry and entrepreneurs in solving day-to-day problems of food production and quality control. Included among the several projects oriented to the development of the agro-based industries in the country are infestation control, pesticides and storage structures; technology for milling, drying and processing rice, millets and pulses; flour milling and banking technology; technology of harvesting, handling, storage, and transportation of commercially significant varieties of tropical and temperate fruits; processing and quality control of coffee beans and development of different coffee products; processing of cocoa

beans and providing know-how to indigenous planters; processing of groundnuts, sesame, mustard and rape seed, sunflower, soya beans and guar beans to be used as protein rich foods, etc. Research on alternate sources of fat; technology of fish oils; technology of processing and utilization of nuts; microbiological standards for protein foods, beverages, and animal foods. The Institute has developed a number of products, processes, techniques and equipment designs during the last 25 years. Besides the main Institute at Mysore, there are experimental stations in many other Indian cities involved in solving regional problems.

B. Building and Architectural design

This sector will not be examined extensively here, since there is a more detailed treatment in the Human Settlements chapter. However, as a way of getting a broad view of the area, it is possible to show some trends in NGO activities.

Developed Countries

i) Utilization of renewable resources and energy conserving measures.

Developed country NGOs are specially concerned with energy considerations in relation to architectural design, building and planning. This preoccupation can be appreciated, both in the utilization of renewable resources of energy, mainly solar energy, and in the inclusion of conservation measures in building and home amenities. Other concerns of NGOs in this field are related to the promotion of new life styles, through decentralized settlements, "ecologically oriented", sometimes looking for technological self-sufficiency in the storing of some supplies such as heating or food. Technologies for recycling are also undertaken by some NGOs.

The use of solar energy is widespread in developed countries and incorporated in architectural design. Solar housing pilot projects are being promoted in several countries, such as "The New Town of Milton Keynes" in the United Kingdom, designed by *Solar Energy Development (0418)*, London, U.K. This is a consultancy, research, professional organisation dedicated to the exploration and innovative use of renewable energy sources, energy conservation techniques and appropriate technology. The proliferation of such organisations in the developed world is enormous and their goals similar - searching to save energy and for low-pollutant technologies. Some sophisticated designs using integrated energy sources are being developed, as in the case of the *Autonomous House Group (0006)*, Sydney, Australia, which is trying to demonstrate that a house can be built with recycled waste from the city, be independent of reticulated services, and able to recycle its own waste. The inhabitants therefore have complete control over their own life-style and welfare. Just to mention another organisation of analogous concern, we have *Alternative Sources of Energy (0426)*, Milaca, U.S.A., devoted to the solution of energy problems in housing through alternative energy sources, basically solar and wind power generation.

Developing Countries

i) Sanitation, low-cost housing and local building materials.

NGOs concerned with the building and construction sector in developing countries are faced with a very different range of priorities, such as sanitation problems, human settlement considerations in the context of rural development programmes or improvement of backward urban areas; research on local building materials and low cost housing technology.

Banwasi Seva Ashram (0177), Govindpur, India, is involved in village settlement improvement projects which include technologies for soil and water conservation; agricultural development and irrigation; conversion of organic waste into compost and methane gas; promotion of sanitation and safe drinking water; prevention of communicable diseases.

Nova 2000, Consultants and Designers (0215), New Delhi, India, are concerned with research and consultancy in the field of low cost housing. A decentralized form of human settlement, self-contained in utilities at micro community level, and the application of appropriate technology - like waste water disposal, feasible at the smaller scale of urban and rural settlements, are among their developments.

The *Housing Research and Development Unit (0248)*, Nairobi, Kenya, have academic and research activities, as well as operational projects and technical assistance for the production and utilization of local building materials and the development of low cost housing technologies, appropriate for developing countries. They also carry out research, on waste management and solar and wind energy.

The *Institute of Urban Housing (0116)*, San Salvador promotes the utilization of available human resources in the manual production of local materials for construction, for example using soap stone, clay, sand, mud and cement for bricks.

ii) Construction for particular environments

Construction for some particular environments such as the tropics, seismic areas, and arid and semi-arid areas, etc., is also a task of some national and international NGOs.

The *Institute for Desert Research (0233)*, Ben Gurion University, Sede Boqer, Israel, is a regional and national organisation concerned with design and planning of desert settlements. The work concerns micro-environments (housing, work places, services, public areas); small settlements; neighbourhood and urban quarters, and total environments including desert landscaping and regions. They concentrate on problems such as how to structure the various components (buildings, streets) in order to create proper environmental conditions in an extreme climate; how to design and locate buildings so as to benefit from climatic factors, such as radiation and wind; what materials and technologies to use; how vegetation may be functionally integrated into the built environment.

C. Transportation:

Developed Countries

i) Infrastructure and Alternative Means of Transportation

This area is related to transportation infrastructure, alternative means of transportation, energy saving, non-polluting transport and directed to urban decongestion.

Ecology and Survival (0128), Mulhouse, France, is involved in the study of ecological alternatives in the present society over a wide range of subject areas. Among their concerns is transport. They participate in the European Convention of Transportation oriented to the co-ordination of European movements against the overdevelopment of highways and big infrastructures and for a reduction of road transport; advocating the utilization of "ecological transports".

The *Transport and Environmental Group* (0421), South Nutfield, U.K., is a national organisation working in connection with other national and international NGOs (*Friends of the Earth* (0388), Cambridge, U.K., and the *National Society for Clean Air* (0403), Sussex, U.K., etc.). They aim to secure and coordinate a national transport policy, which takes account of social needs; the protection of the environment; the efficient use of energy, land and other resources. They are engaged on a project for a fully integrated transport system, with the main emphasis upon investment in public transport.

The *North Craven Action Group* (0406), York, U.K., is a political organisation finding and developing alternatives to road transport. Through media-oriented campaigns and educating people, they are opposed to road construction in Britain.

Bikeways for Buffalo (0434), Buffalo, U.S.A.; *Transportation Alternatives* (0490), New York, U.S.A., *Greater Philadelphia Bicycle Coalition* (0457), Philadelphia, U.S.A., and many other NGOs throughout the world are involved in the promotion of the bicycle as an alternative form of transportation.

D. Health:

Developed Countries

i) General Health Concerns:

In developed countries the *Appropriate Health Resources and Technologies Action Groups* (AHRTAG) (0378), London, U.K. provides an information and technical enquiries service throughout the world in the area of appropriate health technology. It promotes liaison among field programmes, agencies and groups researching economically, environmentally and culturally sound solutions to medical hardware; and to managerial, educational and other technical problems of health care. In addition, they work for the education of all levels of personnel in environmental health areas such as water supply and sanitation. AHRTAG maintains an interest in researching into the control of insect born diseases through altering dwelling construction; and in the transport, storage, equipment and energy supplies needed for refrigerated vaccines, etc.

Developing Countries

Environmentally sound and appropriate technology related to health problems is another field stressed by NGOs in developing countries. Basically, health problems of the developing world are malnutrition, infections and parasitic diseases - all illnesses closely related to the quality of the water supply, sanitation and poverty. As Colin Norman pointed out "80% of the expenditure on health in developing countries is devoted to hospital care, and less than 20% is spent on preventive medicine accessible to the rural and urban poor".¹ According to the World Bank estimate, "some 800 million people have no access to even minimal health care".² The importance of environmentally sound and appropriate technology in this area is major if reorientation of health policies takes place. Colin Norman also indicated, "Expenditures on expensive medical technologies that soak up the bulk of health budgets in poor countries reflects a choice of providing high-quality medical care for a few rather than meeting the basic health needs of many". At present, there are many NGOs in developing countries aware of the importance of providing

services and appropriate technologies to the community in order to improve health standards of the population. Sanitation, community services and especially water supply, are among priorities for many organisations dealing with environmental problems. Just to mention some of these organisations:

i) Sanitation and Community Services:

Medico Friend Circle (0211), Vadodara, India, stresses the need for evolving a pattern of medical education appropriate for local requirements which uses methodologies and techniques of health care for Indian needs and conditions; they are also concerned with rural health care and environmental sanitation.

The *Central Young Mizo Association* (0183), Aizawl, India, is concerned with water supply and communicable diseases as well as public sanitation, public latrines, village paths to water points and improvements of the water points.

It seems important to notice that in spite of efforts to improve the quality and quantity of developing country water supplies, the World Development Report (78) stated: "The percentage of population with access to safe water moves from 8% in Ethiopia, 11% in Indonesia, 8% in Nepal, 16% in Togo, 17% in Lesotho to 100% in industrialised countries."

The choice of technology can determine whether the benefits of health policies can reach only the few privileged, or the whole population. The identification, prevention or control and eradication of some diseases through appropriate technology is a way of trying to meet the basic needs of many.

This point of view was held by Dr. Mahler in the recent Conference at Alma-Ata, September 1978 on primary health care. He supports the approach of "Appropriate technology for health", leading to a demystification of medical technology, and which encourages people to use their own capacities to fight against disease. "The whole community must be involved in the struggle for health", he said. At Alma-Ata, it was also stressed how important were disease prevention, environmental sanitation and the provision of clean water.

The city-based doctors policy must change to a policy of trained people within the community and community-based "bare-foot doctors", able to deal with the majority of diseases that affect the Third World. Also, Dr. Mahler recommended the upgrading of herbalist and other traditional healers.

ii) Local health resources:

Research on indigenous systems of medicine, growing medicinal plants, and experiments on the effects of environmental factors on human health are carried out by many NGOs which include *The Medicinal Plants Garden and Herbarium* (0210), New Delhi, India, and *Geobios* (0192), Jodhpur, India.

The *Institute of Pathobiology* (0117), Addis Ababa, Ethiopia, concentrates on the study of diseases and application of local resources in scientific and in situ research. Among other projects, the Institute has a study of medical plants; study and application of Endod (local molluscicide); education of people in growing endod; control of bilharzia, projects on schistosomiasis, etc.

The idea of utilization of local resources and the promotion of community participation in

¹ Norman, Colin. Soft Technologies - Hard Choices. World Watch Paper 21, June 1978.

² International Bank for Reconstruction and Development, World Bank Report 1978, World Bank, Washington DC, 1979.

relation to health is shared by many NGOs. Thus, *The Young Christian Agriculturalists* (0089), N' Djamena, Chad, encourage village groups in the improvement of health in the village; and have water related projects, such as sinking and development of wells, improvement of hygienic conditions and the quality of family and social life.

The *Christian Fellowship Hospital* (0186), Oddanchatram, India, is involved in healing, education, and development of rural areas. They are concerned with environmental sanitation and improving fresh water supplies through tube wells.

Among the several sectors included by the *Melanesian Council of Churches* (0312), Boroko, Papua New Guinea, in their activities, health is an important one and provides information on nutrition, family planning, breast feeding and healing. They compile information on bush medicines and medicinal plants also.

What seems important in the approach of these NGOs and others in the area, is the idea of appropriateness related to health. For instance, nutritional patterns are encouraged to follow cultural and dietetic requirements of the region, instead of conforming to an homogenized pattern promoted by the market. The great variety of products, sometimes sophisticated, is replaced by the most nutritious and appropriate food composition, according to the characteristics of the country. Interest in breast feeding is a good example of that position. Concerning this point, they say: "Third World babies are dying because their mothers bottle feed them with western style infant milk. Many who do not die are drawn into a vicious cycle of malnutrition and disease. In the squalor and poverty of the new cities of Africa, Asia and Latin America this decision is often fatal". (The Melanesian Council of Churches)

National Institute of Nutrition (0213), Hyderabad, India, is involved in research in various dietary and nutritional problems in order to elucidate the factors responsible for malnutrition and evolve appropriate methods of treatment and prevention and make use of the currently available administrative set-up and facilities. Studies on breast-feeding practices; investigation of the relationship between nutritional status and work output, etc., are among the achievements of the organisation.

The *Voluntary Health Association of India* (0228), New Delhi, is an educational NGO of national scope, strongly emphasising an integrated approach to environmental health as an integral part of development. They are involved in environmental sanitation and the use of low-cost indigenous technology as the two key factors in community health and training programmes. The organisation is building up a documentation centre having, among other subjects, material on environmental issues. They also have educational material on many forms of environmentally sound appropriate technology. A bi-monthly bulletin of the organisation is "Health for the Millions".

The *African Medical and Research Foundation International* (0243), Nairobi, Kenya, is trying to adapt their resources and possibilities to the scarce medical facilities and skills available in the region, through the provision of mobile medicine (carrying out, for example, immunizations, surveillance, curative medicine) as well as a sanitation project and demonstration unit to provide services and research (e.g. refuse disposal, water supplies, pit latrines, food storage, protected wells, health education programmes to rural population groups.)

E. Energy Technology

Research and operational projects on the generation or application of technologies for the utilization

of non-conventional and renewable sources of energy, are being developed considerably by NGOs throughout the world. (See the Energy chapter)

Developed Countries

As a general trend, many NGOs in developed countries are engaged on future energy projections and in global energy strategies, aiming to determine energy options for the forecoming years. The introduction of renewable sources of energy in future energy scenarios, considering the possibilities of an important energy supply due to solar, wind, geothermal, photovoltaic conversion, biomass energy, tidal power and wave energy, cover an important part of NGO preoccupations. These concerns are given, together with energy conservation measures, in relation to the utilization of non-renewable resources. Other NGOs in developed countries are more specifically oriented to the research and/or promotion of technologies related to a particular source of energy.

Activities in this field may be at a purely academic level, or be accomplished at a research and public level involvement. Technical meetings and seminars have been held by many NGOs in order to discuss energy policies for the present and the future. Handbooks and other publications are abundant in the field, trying to inform and to raise public understanding and commitment on energy issues. Networks on the subject are also part of NGO activities, such as the *Soft Energy Path International Project*, created by *Friends of the Earth International* (0455), San Francisco, U.S.A. Other activities are of educative character, and oriented to the public in general, usually carried out by mass campaigns and demonstrations, or oriented to organise citizen action groups for action and for influencing the legislative spheres.

i) Global Energy Strategies

Energy Probe (0074), Toronto, Canada, is involved in the complete spectrum of Canadian energy policy issues. It is working to ensure long-term solutions to the energy crisis in terms of protecting and enhancing the ecological stability of the environment. By looking at energy planning as a series of interrelated factors, including macro-economic criteria, energy efficiency, net energy delivered to the consumer, vulnerability and safety of the system, environmental soundness, social equity and political stability, *Energy Probe* are becoming convinced that an immediate allocation of resources to a combined programme of energy conservation and renewable energy technologies is the best path to pursue. The organisation published "The Renewable Energy Handbook" to aid public understanding of renewable energy, building a Canadian Renewable Energy Scenario.

The *National Council of Churches* (0471), New York, U.S.A., organises an Energy Ethics Consultation, to inform the National Council of Churches Committee on Energy Policy, the implications of energy use, and technology for energy production.

ii) Research on Renewable Sources of Energy:

The *International Solar Energy Society* (0017), Victoria, Australian and New Zealand Section, has as goals: to further the advancement of science and technology relative to solar energy; to encourage basic and applied research and development; to organise symposia and technical meetings on the problems and potential use of solar energy.

Elektro GMBH (0348), Wilterthur, Switzerland, are specialised in wind-energy conversion systems.

The Natural Energy Centre (0404), Kingston, U.K., is a commercial, scientific organisation involved in the promotion and development of alternative energy systems. They have been responsible for designing, supplying and building some of the largest solar panel installations in Britain (for schools and local authorities), as well as supplying and installing numerous wind-driven generators and heat pumps, designing and building methane digesters, water driven turbines, wood waste burning stoves, electronic energy monitors, instruments, tools and spares. A Handbook on "How to Use Natural Energy" has been produced by them.

iii) Energy Issues related to General Environmental Concerns:

Some NGOs consider the energy issue in the context of general environmental preoccupations. These organisations are mainly NGOs concerned with information and mass involvement, as in the case of *The Association of Journalists and Writers for the Protection of Nature and the Environment (0123)*, Paris, France. Solar energy promotion is connected to various programmes dealing with conservation of nature, protection of the ecological balance and stopping French nuclear tests.

Mass oriented campaigns and actions aiming to influence legislative and political decisions are abundant in the field of atomic power generation.

The Campaign Against Nuclear Energy (0008), Adelaide, Australia, works to prevent Australian involvement in any part of the nuclear fuel cycle and to promote alternative energy technologies.

Developing Countries

In developing countries, NGO energy technology research is, most of the time, oriented to meet basic human needs with a minimum of technical sophistication.

i) Renewable Resources for the Satisfaction of Basic Human Needs:

Gram Seva Samiti Taronda Nitaya (0194), Madhya Pradesh, India, is an organisation of local scope working to improve the quality of the village life through the introduction of Gobar-gas plants, compost making, use of cement ring wells and water seal latrines. They are connected with other national NGOs, such as the *Gandhi Memorial Trust (0191)*, New Delhi, India.

The *Inter-State Organisation for Advanced Technicians of Hydraulics and Rural Equipment (0499)*, Ouagadougou, Upper Volta, is involved with the protection of drinking water, the collection and treatment of waste water, problems related to soil and water conservation, community sanitation, experiments on solar pumps.

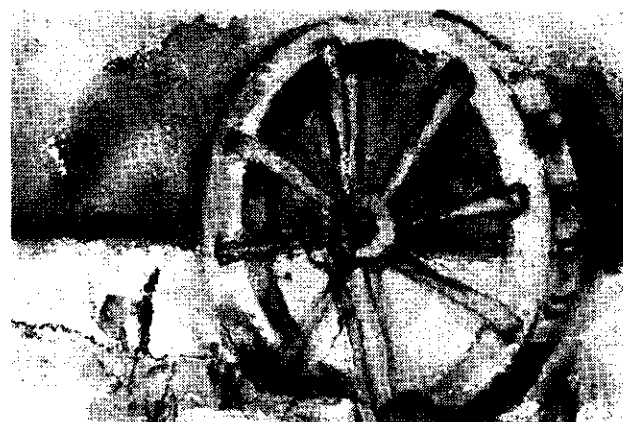
The *Environment Foundation (0276)*, Mexico, is promoting non-conventional technologies directed to the self-sufficient fulfilment of basic needs in rural areas. Experimental research on alternative sources of energy, with the minimum of technical sophistication is being carried out in the field of wind and solar power generation, as well as biogas production from waste material. Experimental projects on pisciculture, hydroponics and cuniculture are also being carried out.

ii) Renewable Resources for Small Scale Industry:

The National Association of Manufacturers (0099), Medellin, Colombia, is involved in research and dissemination of technologies which permit the use of alternative sources of energy, both for industry and for home use in rural areas.

The Industrial Information Center (0168), Tegucigalpa, Honduras, is an organisation of local scope oriented to industrial development. They have particular interest in research and encouragement of the manufacture of low-cost equipment, using natural energy sources, such as solar, hydraulic and wind energy.

Projects Development Agency (0305), Enugu, Nigeria is a research and development agency involved in industrial development subjects. They are developing cheap solar-heaters to be manufactured locally and also solar driers for agricultural production.



F. Industry:

All countries

Appropriate technologies related to the industrial sector cover a wide range of activities. Some of them are concerned with industrialised building systems, as in the case of *The Faculty of Architecture, Silpakorn University (0372)*, Bangkok, Thailand. This group is engaged in the study of industrialised building systems for middle income housing (modular coordination and standardized building materials in building design; conservation of wood as building material aimed to prevent wood wastage in construction).

i) Waste and Recycling:

The *Indian Institute of Technology (0199)*, Kanpur, India, is an organisation of national scope concerned with teaching and research to strengthen the technological base in India, carrying out programmes on water and wastewater treatment and on environmental engineering.

Recycling and re-use of wastes is another area of NGO activity. The *Dextrel Institute of Technology (0444)*, Philadelphia, U.S.A., is a multidisciplinary academic and research institution carrying out research on the treatment of tribalomethanes and liquid waste.

BC Research (0065), Vancouver, Canada, conducts research in support of the public and private sector. Some examples are the biological treatment of municipal and industrial waste, through a rotating biological disc; activating sludge treatment; detoxification of pulp and paper mill effluents; fermentation of wastes; dust control; odour abatement; treatment systems for biodegradability of organic pollutants; techniques for assessing the acid-producing potential of both ore and waste rock, algal assays, and recycling of fish hatchery water. They publish a newsletter, guidelines and reprints of technical articles.

The *Swedish Water and Air Pollution Research Institute (0341)*, undertakes operational pro-

jects and research in methods for handling and use of solid waste, recycling, and low energy methods for external treatment of liquid and solid waste.

Agrar und Hydrotechnik GmbH (0150), Essen, Germany, is a national and international consultancy, planning and supervising development projects in the fields of natural resources, processing industries, agriculture, etc. Among other projects, they are involved in mechanical, biological and/or chemical purification of municipal and industrial waste water and reutilisation and/or disposal of solid waste: composting and heat and power production by putrefaction, sewage sludge and other organic materials.

The Structural Engineering Research Centre (0221), Madras, India, provides design and consultancy service for all types of structures. Their development of appropriate technologies for the design and construction of several types of structures such as buildings, bridges, transmission line towers, industrial sheds, grain-storage silos, machine foundations, etc., has been the major activity of the Centre right from its inception. Efforts are also made to utilise waste materials such as fly-ash, blast-furnace slag, and other industrial wastes in the construction of buildings and other structures. Special emphasis has been laid on the development of techniques that are less energy intensive. An economical method of producing bricks from lateritic soil using an energy-saving production process has been developed by the Centre among many other projects.

ii) Small-scale Industry:

International and local NGOs oriented to Third World development are active in the promotion of small-scale industry.

The Appropriate Technology Development Association (0176), Lucknow, India, developed small-scale rural industry with the goal of creating a self-sustaining development in rural areas, independent from central resources, and to promote capital formation and employment generation. In this context a decentralized cotton spinning industry in rural India was launched. Rural weavers produce nearly 50% of the cotton cloth and nearly 100% of the man-made fibre cloth woven in India. The Association produces yarns of all types and qualities demanded by weavers at competitive prices, and the industry is economically viable. Projects on the development of appropriate technology, for decentralising the pottery industry in rural India, for "mini-sugar technology and mini-cement plants", have been carried out. Also studies on rice milling technology, flaying, tanning of hides and skins and carcass utilization; social forestry; research studies; testing and improving efficiency of solar cookers; and initiating microbiological research in bio-gas technology.

The Swiss Association for Technical Assistance (SATA) (0380), is an international organisation providing technical assistance to developing countries. Among its projects there is the installation of small scale industries in Nepal, such as a cheese factory, using solar energy combined with methane gas. Other projects are the construction of water turbines and solar water heaters also in Nepal.

The Institute for Small Scale Industries (0321), Quezon City, Philippines, is involved in the utilization of water hyacinth, instead of extermination. Potential target groups to be benefited will be the residents of the community in which water hyacinth abounds. The area of concern is the use of the water hyacinth as a primary raw material for pollution control, lake rehabilitation, textile yarn, food, feed ingred-

ient and numerous other uses. The duration of the project will depend on the rate of experimentation and financial support. Another project closely related to this one is the generation of industries in the area. An economic survey was undertaken to determine what industries may prove feasible in the area.

The Research Institute for International Techno-economic Cooperation (0158), University of Aachen, Germany, are specialised in international relations, mainly techno-economic cooperation, development aid, direct investment abroad, international trade, etc. Their main aim is to investigate possibilities of intensifying economic growth by means of technology, in particular through the industrial process. In the field of technology related to food production, the organisation is examining methods for controlling the water hyacinth and using it to best advantage, especially those methods that show promise for less-developed countries. It emphasises techniques for converting it for feed, food, fertilizer and energy production.

In the field of agro-industry, the *Mauritius Society for Agriculture and Sugar Industry Technology (0271)*, Reduit, Mauritius, fosters the development of agricultural science and technology, with an emphasis on the sugar industry. They produced a document on 'Methods of Control and Analysis for Mauritius Sugar Factories', papers on cane agro-nomy and sugar technology as well as on production of food crops, fruit and meat. The society also publishes a quarterly magazine in English and French 'Agriculture and Sugar Review of Mauritius'.

The manufacture of cement from rice-husk ash and the production of methane from cow-dung and other vegetable wastes, is a task undertaken by the *Science Education Centre (0271)*, Atarra, India. *Jamnalal Bajaj Central Research Institute for Village Industries (0205)*, Wardha, India, is involved in the technological development of village industries. They provide a scientific expertise to improve existing traditional methods, tools and techniques of village industries. Among their projects is the utilization of oil-seeds for the industries, to meet the shortage of fat for industrial purposes; processing of cereals; utilization of unpolished rice in food preparation; honey research; utilization of bones and fleshing for the leather industry and hand-made paper industry: converting bags and tailor cuttings to high grade paper.

The Industrial Corporation for the Regional Development of Bio-bio Region (0090), Concepción, Chile, is involved in diverse appropriate technology projects, for example: anaerobic digestion into organic fertilizers and biogas; the utilization of saw dust as a fuel for heaters in commercial and residential buildings; construction of a hydroelectric micro-plant for providing electricity to the village of Pitril; fish conservation through a drying process in mountain altitudes (800 metres above sea-level); experimental raising of frogs for meat marketing; yield improvement through a process that permits the application of saw-dust as fertilizer; honey and polisher production through apiculture carried out in pine plantations; pine-resin distillation for the preparation of turpentine and other products; winter orchard production by orchard protection through plastic bags; utilization of seaweed extract as fertilizer; design of a wild fruit drier; mushroom cultivation under pine forests. The organisation has publications in all the above-mentioned areas in the Spanish language.

2.2 EXAMPLES OF NGO ACTIVITIES

CONSIDERING TECHNOLOGY WITHIN AN INTEGRATED DEVELOPMENT APPROACH

The NGOs in this group assign to technology an essential role in the development process. The following statement of the *Appropriate Technology Development Association (0176)*, Lucknow, India, illustrates their approach: "Technology is the basic factor which determines the structure and organisation of the society. It plays a pivotal role in its functioning and maintenance, and as technology changes, so do the patterns of society."

The scope of the activities of NGOs taking similar positions may vary from particular communities to wide regions or countries, but they have in common the promotion of an appropriate technological style. One important NGO embracing that position is *The South Pacific Appropriate Technology Foundation (SPAFT) (0316)*, Boroko, Papua New Guinea. They stress the importance of a sustaining ideology supporting their vision of development, and they link that vision with the utilization of appropriate technology. They state: "SPAFT's aims are to gather information on tools, techniques and ideas; to develop these in ways that could make them appropriate for Papua New Guinea conditions; to move the information to those striving for self-reliance; to demonstrate that appropriate technologies can be used effectively to foster community, individual and national self-reliance". The organisation is involved in generation, transfer and adaptation of technology concerning both "software" (the knowledge, the awareness, the information, and the communication) and "hardware" (the machines, the tools, and the equipment). Many development projects are being accomplished by the organisation, such as an experimental farm, aiming to diversify agriculture as the subsistence base of the community; a "Mobile Appropriate Technological Exchange", created to reach the people in the villages. They organised the "National Women's Workshop on Appropriate Technology", stressing tradition-linked technology and technical aspects of village development through community participation. Various technological innovations have been developed, related to village level technologies.

The *Melanesian Council of Churches (0312)*, Boroko, Papua New Guinea, provides an integrated approach to development, considering that "appropriate technology, intermediate technology, self-help technology are becoming common terms in Papua New Guinea. Even though they have considerable advanced technology, they say: "there is a growing appreciation for technology which our people in the village can initiate, maintain and control - technology which uses locally available resources, and which fits better with our way of doing things". They add: "Papua New Guinea has a rich and varied treasure of basic technology as an integral part of her culture. So appropriate technology is not new. The challenge is to encourage our people to continually rediscover themselves and their capabilities to create and innovate." In this context, the generation and utilisation of appropriate technology for shelter, building and road construction, health, village industry, agriculture, etc., is given inside a community for self-reliant development.

Another organisation dealing with technological considerations in development planning is ENDA, *Environment Training Programme (0329)*, Dakar, Senegal. Since 1972, Enda has organised workshops, seminars and research action projects on varying aspects of development in different ecological zones in Africa. In relation to the generation of technology, Enda has emphasised popular technologies and spontaneous inventions; the study of the conditions of technological creation and innovation by less favoured social groups; and

developing an inventory of endogenous technology by ecological zones. They work also in the adaptation and transfer of technology, improving traditional techniques and reinforcing South-South relations, particularly in the field of technology transfer between developing countries and different eco-cultures.

In India, the *Appropriate Technology Development Association (0176)*, Lucknow, a private, academic and research group, stresses the environment-development relationships and the consideration of them at policy and planning level. Their conception of development stresses the importance of the main links between policies and plans, and in relation to this they state "If changes are introduced in an isolated and haphazard manner, they become self-defeated. For example, provision of drinking water creates problems of sanitation, drainage, water logging and breeding mosquitoes and other germs. Thus water supply must be undertaken together with drainage and sanitation programmes... An integrated approach to environment and development is absolutely necessary, in order to deal with the chain of consequences that each policy or action can produce".

They define themselves as the "sister organisation of the Intermediate Technology Development Group of London", following Shumacher's ideology "towards smallness rather than gigantism; towards simplification rather than growing complexity; towards capital saving rather than labour saving; towards non-violence in a rather generalized sense". Their achievements cover a wide range of sectors and aspects, such as the creation of appropriate technology aiming for a self-sustaining development of rural areas, generation of alternative energy sources (power tiller, solar energy), home and community living, technology-like housing, water supply, drainage, kitchen fuel, etc. Special stress is laid on linking education to socio-economic development and orienting schooling towards local needs. This organisation works mainly through operational projects and technical assistance and training, being concerned also with the task of dissemination and promotion of appropriate technology.

3.1 NGO FUNCTIONS IN THE APPROPRIATE TECHNOLOGY FIELD

3.1.1 Dissemination of Information

NGOs are very active in the information field, using different ways of approaching the problem. Among them, it is possible to mention:

i) Network of information:

The creation of a network of information in the form of Encyclopedic index cards; such work is being done by the *Project Oikos (GRET) (0134)*, Paris, France. *Tool (0293)*, Amsterdam, the Netherlands, has a "Socially Appropriate Technological Information System" (SATIS), for storage and exchange of information.

Tranet (Transnational Network for Appropriate and Alternative Technologies) (0489), Rangley, U.S.A., publishes a newsletter with a directory of the worldwide network of Appropriate Technology Centres.

Enda (Environment Training Programme) (0329), Dakar, Senegal, established a network of information and exchange of experiences on appropriate technology, "Relais technologique pour l'ecodeveloppement et l'amenagement dans les Environnements africains".

AtoI (Appropriate Technology for Developing Countries) (0037), Louvain, Belgium aims to construct a bank on technology as well as a network for dissemination and exchange in a specialised documentation centre on appropriate technology.

The Committee on Science and Technology in Developing Countries (0187), Bangalore, India, created ATIS - Appropriate Technology Information Service. Their principal objectives are to create data bases in special problem areas of local importance; to publish and distribute basic popular science information; and to organise mass media material for immediate use. ATIS publishes a periodical newsletter devoted to specific problems.

ii) Handbooks and Catalogues:

NGOs produce Handbooks and Catalogues on Appropriate Technology for diverse subject areas. Among them, it is possible to mention:

- The Liklik Book, a rural Development Handbook, Catalogue for Papua New Guinea, produced by the *Melanesian Council of Churches* (0312), Boroko, Papua New Guinea.

- Vita's Village Technology Handbook, produced by *Volunteers in Technical Assistance (VITA)* (0493), Maryland, U.S.A.

- Appropriate Technology Sourcebook by Ken Darrow, and Rick Pam, *Volunteers in Asia*, California, U.S.A.

- Energy for Rural Development, Renewable Resources and Alternative Technologies for Developing Countries. *National Academy of Sciences*, (0469), Washington DC, U.S.A., 1976

iii) Technical bulletins, books, newsletters:

NGO production of Technical Bulletins on wide variety of subject areas related to the utilization of Appropriate Technology. Among the great variety of them it is possible to mention:

- Vita Technical Bulletins, produced by the *Volunteers in Technical Assistance (VITA)* (0493), Maryland, U.S.A. These bulletins are supposed to be "idea generators". Each design has been made available so that it can be constructed, tested and adapted.

- Tranet Newsletters, from the *Transnational Network for Appropriate and Alternative Technologies* (0489), Rangeley, U.S.A., which help appropriate technology developers to establish non-governmental cooperative links.

- The Newsletter of the Agriculture Development Agencies (0034), Dacca, Bangladesh, includes a monthly section on Appropriate Technology. The organisation also has periodical forums on the subject.

- Vita has published nearly 40 appropriate technology books. *The Intermediate Technology Development Group Ltd.* (0395), London, U.K. publishes an 'Appropriate Technology Quarterly'. Through the *Intermediate Technology Publications*, they disseminate information on intermediate technology, related to diverse subject areas (Energy, building, agriculture, etc.), as well as complete technical drawings, designed for local construction.

- *The International Institute for Environment and Development (IIED)* (0397), London, U.K., created Earthscan, a media programme on selected problems of the global environment. It is particularly concerned to increase the flow of environment-development information into and within

the developing world. Among the selected subject areas is appropriate technology.

- *The Community Planning Association of Canada* (0071), Saint John, Canada, is a research and educational citizen action group involved in the improvement of the environment. They established an appropriate technology advisory service. Among their books and documents is "Technology for People 1978"; proceedings of a Conference on Appropriate Technology and publications and periodicals on energy conservation and appropriate technology.

3.12 Academic Research, training and educational conferences and meetings.

Research, training and education in technological fields is another important area of activity for NGOs.

The Committee on Science and Technology in Developing Countries (COSTED) (0187), Bangalore, India, has been organising several seminars, workshops, and training programmes in developing countries with the idea of promoting scientific collaboration between scientists within the region and to promote transfer of technology within developing countries. In order to improve science education in the region, some science teaching techniques are developed such as slides on selected themes accessible to the teaching community; examples given to illustrate scientific principles are close to the daily experience of students in developing countries. The generation of new material depends upon the feed-back received from the scientific community of their member countries.

The Unit of Land Use Training (0507), Biology Department, University of Zambia, is evolving appropriate techniques in land use and agriculture as a part of on-going and training activities.

The Ecological Society of Thailand (0373), Bangkok, in cooperation with the *Faculty of Environment and Resources Studies* (0373), Mahidol University, prepared a course on Appropriate Technology to be carried out this year.

The Pacific Science Association (0480), Honolulu, U.S.A., initiates and promotes cooperation in the study of scientific problems related to the Pacific region. Among their activities, the Association organised a congress, the Third International Congress, held in Bali, Indonesia 1977, on Appropriate Technology. A publication on the congress issued by the host organisation is "Proceedings in the Third Inter-Congress", 1978.

The Environmental Studies Section of the International Studies Association (0452), Michigan, U.S.A., organised several panels on different environmental issues as well as workshops. Last year, the institution held a workshop on "A People's Input into the 1979 UN Conference on Science and Technology for Development", which dealt with the lack of concern with Appropriate Technology and Global Limits in UNCSTED preparations. Also a Taskforce on Appropriate Technologies - The Environment and Alternative Futures - was held, having two levels of activity: one relates to preparations for the 1979 UN Conference on Science and Technology for Development (UNCSTED). Out of it came an organisation, a *Coalition for Alternative Approaches to Technology, Environment and Development (COFAA)*.

The Scientific and Technical Unions of Bulgaria (0061), Sofia, Bulgaria, has started the publication of a series of technical reports on

Environmentally Sound and Appropriate Technology, oriented towards diverse industries. The organisation is also concerned with the publication, of technical reports on the rational use of energy and materials. They are currently dedicated to the organisation of symposiums and conferences in the above-mentioned themes, having organised one in Sofia to be held in 1980, on Appropriate Technology.

3.13 Mass Education, communication and Information

In the appropriate technology field, usually NGOs are more specialised than in other fields; their activities are more related to generation, transfer or dissemination of technology than with public opinion involvement or mass mobilisation. Nevertheless, some NGOs are engaged in mass communication. Normally, their activities cover a wide range of subjects - or are related to general environmental concerns. Examples of these are: *Pollution Probe* (0517), Ottawa, Canada. This NGO is a citizen action group with local scope, working mainly through educational and informative activities, trying to influence policies and legislative decisions. Among their functions, they promote awareness of some environmental problems and the need for environmental quality. The organisation sponsored a "Canada Food Week 1977" and introduced environmental education in Ontario schools. They are also concerned with the reduction of solid wastes by recycling processes and with investigation into the presence of mirex in the Great Lakes. For dealing with technology and energy aspects, the organisation built a museum of Energy Conservation and Alternative Technology.

"To live is necessary - Papers on Ecology and Society" (0327), Lagos, is a Portuguese organisation involved in the establishment of a centre of research and in the arrangement of meetings on organic agriculture, soft technology and community life, as well as in the dissemination of information and activities oriented to influencing legislative and political decisions.

The National Scientific and Technological Assoc. for Youth, (0144), Paris, France, is a scientific and youth educational organisation, having more than 25000 members. They publish a bulletin, "Salicorne", providing information and technical cards on technologies related to diverse environmental issues. Among them are some easy designs for the utilisation of solar energy. They teach youths during holiday periods and train teachers on their programmes.

Forum for Responsible Application of Science (BASE2) (FOW) (0349), Fluh, Switzerland, is an international organisation engaged in investigating scientific and technical projects and enterprises to ascertain whether they are justified in the public interest and whether they take due consideration of the environment. They analyse official reports about radioactivity, and coordinate activities with groups for energy research and alternative technology.

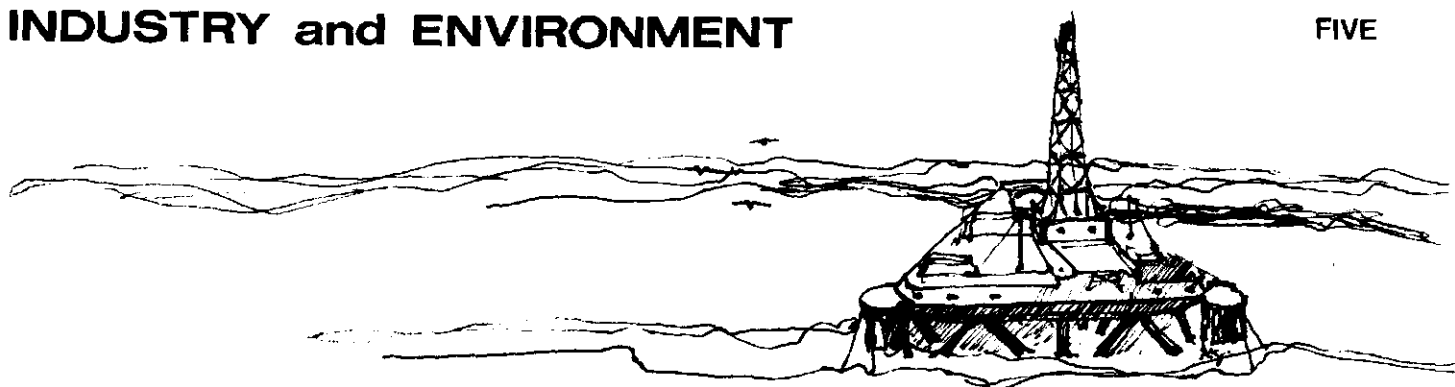
Intermediate Technology (0463), Menlo Park, U.S.A., is a resource and information clearing house, originally formed to honour and publicise the ideas of Dr. E.F. Schumacher in America. Additionally, the Institution is programming projects on the use of wood fibre, tree crops and honey locust as alternative sources of food; and a weaving industry: sheep, wool, looms and marketing.

to particular matters or sectors, or to a more comprehensive inclusion of technology in a holistic approach to development, as indicated in the sectorial review.

Besides NGOs already mentioned, the *Intermediate Technology Development Group Ltd. (ITDG)* (0395), London, U.K., is engaged on the identification and development of technology which will maximise labour input, consistent with maintenance and improvement of production levels in developing countries. The organisation compiles inventories of existing technologies which can be used within the context of low-cost, labour intensive production and identifies gaps in the existing range of technologies. They have projects in most African countries, and in other developing countries in the field of agriculture, building and building materials, cooperatives, homestead technology, nutrition, power, rural health, transportation and water.

3.14 Operational Projects, Technical Assistance and Training:

NGO action oriented activities are the most common in the Appropriate Technology field. They relate



1.1 GENERAL STATEMENT

It is in developed countries that there is the greatest interest and activity among NGOs concerning the high investment capital industries and the environment. NGOs in developed countries concentrate their activities around protection of the community and of industrial workers from the bad effects resulting from some industries.

In developing countries, the main interest is the need for employment, and NGOs are more likely to be working to support small-scale industries than to be concerned with protection measures needed because of modern large-scale industries.

The main kinds of NGO activity are:-

Developed Countries

- A
Environmental Protection for the community -
 - (i) Pollution monitoring and control
 - (ii) Industrial Products and the Consumer
 - (iii) Health of the community and industrial workers
- B
Employment Generation
- C
Training and Education
- D
Industrial technology
- E
Ethics in industry

Developing Countries

- A
Environmental Protection for the community -
 - (i) Pollution monitoring and control
 - (ii) Industrial Products and the Consumer
- B
Employment Generation and Industrial Development
- C
Training and Education
- D
Appropriate technology for Industry

1.21 General Trends in NGO Activities in Developed Countries

Perhaps the greatest stimulus to community action in recent times came through concern that some industries were polluting the air and water of the communities in which they were situated and that this was affecting the health of people and their environment.

A. Environmental Protection for the community

(i) Pollution Monitoring and Control:

Such is the interest in pollution that some NGOs specialize in the pollution of one particular natural resource, for example of air, water or soil, and there are also those which specialize in noise pollution. The section containing examples of NGOs involved in pollution concerns is divided into:-

- . Air pollution
- . Water pollution
- . Noise pollution
- . General pollution concerns

(ii) Industrial Products and the Consumer:

Control of the quality of products of industry to be

used by consumers is the concern of a number of NGOs whose interests include support for a consumer society ethic and/or health of the workers and the public.

Those concerned with consumerism tend to be citizens groups which attempt to catalyze the public, government and industry to improve the environment and reduce pollution by practising a consumer rather than a consumer society ethic. They aim to reduce the production of wasteful and polluting consumer items as well as alerting the consumer to the need to stop buying and using such products. Apart from citizens organisations, there are also other NGOs with sophisticated research capacities for testing environmental quality and setting environmental standards for industrial products and by-products.

(iii) Health of the Community and Industrial Workers

Various kinds of NGOs are concerned with health as related to industry, ranging from citizens groups to industrial organisations to medical research organisations. Most interest is in physical health rather than mental health. The section containing examples of NGOs involved in this area has been divided into the following sub-headings:

- . Community health
- . Handicapped persons
- . Occupational health

B. Employment Generation

NGO interests in employment generation seem to be motivated by two main trends: the need for employment in an economic situation of large-scale unemployment and the need for environmentally sound job creation. This latter concept includes jobs having the characteristics of being socially useful rather than just oriented to consumer values, meeting ecological standards in relation to the environment, using resources efficiently with a minimum of waste, and satisfying the need for work, by providing work which is not unduly tedious and repetitive but allows decision-making and stimulates the creativity of workers. Employment generation seems to be a newly developing interest so that among the NGOs in the survey most attempts to create such jobs are still in the planning rather than the implementing stage.

C. Training and Education

Few developed country NGOs mentioned this activity in relation to industry. However, under the previous heading, creation of employment opportunities by creation of new kinds of jobs may require the involvement of NGOs in training or retraining when their projects are more advanced. Trade unions commonly have some kinds of training programmes for their members, particularly in trade union affairs.

D. Industrial Technology

The development or improvement of technology is necessarily a function carried out only by

NGOs with professionally and technically qualified staff. They tend to be research organisations. More detailed information will be found on this in the Chapter entitled 'Environmentally Sound and Appropriate Technology'.

E. Ethics in Industry

NGOs concerned with industrial ethics as they relate to the environment range over an enormous variety, from the conservative to the radical, from those whose actions are mainly annual meetings to those who use street demonstrations or actually physically block the actions of industries which appear to be irresponsible or immoral in their actions. NGOs concerned over industrial ethics are having an increasingly important impact, not just in the developed countries but internationally. They are raising the consciousness of citizens to the wide environmental impact that irresponsible industrial development can have on such issues as the transfer of polluting technologies to developing countries, and the effect on marine life over wide areas from dumping of radioactive wastes.

1.22 General Trends in NGO Activities in Developing Countries

The main NGO concerns related to industry and the environment are not as clear across developing countries as they are in developed countries. However, it is clear that there is a different orientation in developing countries reflecting the greatly felt need in most countries to industrialise and employ people. The most common NGO interests are related to employment generation and industrial development. Education and training is also a major interest, usually carried out in combination with the promotion of an industry set up to employ more people.

The *Pakistan National Federation of Trade Unions (PNFTU)* (0310) wrote to us the following: "... we as a Trade Union Organization are still struggling to obtain job security, more employment opportunities, maintenance of health and hygiene standards. A large majority of the workers in under-developed countries are still forced to work and live in sub-standard and deplorable sanitary and hygienic conditions, consequently our efforts so far in the field of environment are confined to seeking hygienic conditions at work places and such basic requirements as provision of clear water, proper accommodation, sewerage and playgrounds for the children in the workers' localities."

The scale of industry related to NGO activities in the developing countries is likely to be small. Those NGOs seeking to generate employment are tending to work from a village level, setting up home and village industries which are labour intensive, require little or no skill to start, can provide training on the job, provide an income for the worker which supplements other income sources or provides a low wage but adequate to live on.

A. Environmental Protection for the Community

(i) Pollution Monitoring and Control:

Concern for pollution from industrial production is less prominent than in developed countries. However, in large urban centres of the developing world there are NGOs concerned with water, air and noise pollution. These NGOs are likely to draw attention to the prevalence of pollution and the need to prevent it by publicising the issue in local newspapers, and through lectures, radio

and TV presentations. They may also produce their own literature which is circulated to members and others interested.

(ii) Industrial Products and the Consumer:

NGOs concerned with consumer protection usually either carry out research on the quality and safety of industrial products or observe and publicise bad products and, where possible, use the results of research done by others on the products about which there are complaints. However, the cost of carrying out research on industrial products is prohibitive for most developing country NGOs to consider and the more usual approach taken by NGOs is to respond to complaints or observations on bad industrial products by making further enquiries of the consumers and sometimes also of the producing company and reporting research done by other organizations which should be known to consumers.

B. Employment Generation and Industrial Development

Given that almost all NGOs who are active in developing countries have little or no income, their efforts to generate employment concentrate on small-scale, low-skill enterprises. Small-scale industries are often associated with the development and use of environmentally sound and appropriate technologies and, where this is so, you are referred to the chapter specifically on this topic. They tend to be associated with integrated projects which are not just aimed to set up an industry which employs people but, for example, may also be concerned with the nutrition of the employees, their mental and physical work environment, basic education and improvements in housing.

Encouraging industrial development are NGOs in both the high investment capital industries as well as those interested in small-scale, low-investment capital industries related to employment generation.

C. Training and Education

A great proportion of NGOs working in industry or associated with it have the purpose of providing vocational training or education of some kind. This can be in the form of on-the-job training, in specific training courses, or in evening education classes. There are also NGOs which provide educational materials such as films and books to educate their audience as to the need for environmental considerations in relation to industry.

D. Appropriate Technology for Industry

This is a very important field for NGO participation in developing countries, especially as it concerns small-scale industry. Information on this is given in the chapter entitled 'Environmentally Sound and Appropriate Technology'.

2.1 EXAMPLES OF NGO ACTIVITIES IN DEVELOPED COUNTRIES

A. Environmental Protection for the Community

(i) Pollution Monitoring and Control:

There are NGOs concerned with the pollution of one particular natural resource, for example of air, water or soil and also some which specialise in noise pollution.

Air pollution - NGOs particularly interested in air pollution include research institutes, citizens groups and health-professionals' organisations. They write and publish reports,

publicise the issue through the mass media, organise meetings, conferences, publish periodicals and educate and inform professionals whose work brings them into contact with the issue. Such NGOs are the *Clean Air Society of Australia and New Zealand* (0011), Eastwood, Australia; the *Inter-Professional Technical Centre for Air Pollution Studies* (0142), Paris, France; the *New Zealand Clean Air Society* (0297), Christchurch; the *Swedish Water and Air Pollution Research Institute* (0341), Stockholm, Sweden; the *Research Group for Investigation/Prevention of Silicosis* (0358) Zurich, Switzerland; the *National Society for Clean Air* (0403), Brighton, United Kingdom; the *Air Pollution Control Association* (0425), Pittsburgh, USA; and the *American Lung Association of Louisiana Inc.* (0428), New Orleans, USA.

Water pollution - Of the NGOs which specialise in water pollution, a great proportion of them are research institutes which not only locate and examine polluted water but find means for treating and recycling it. Nearly all of them are concerned with water polluted by industrial wastes but sometimes also include water polluted by domestic waste. Some organisations specialise in water that is either fresh or salt water, or in water of particular geographical locations such as a particular sea or lake. An NGO for professionals working in water resources and management in Austria is the *Austrian Water Resources and Water Management Association* (0030), Vienna, who carry out surveys, provide guidelines on waste water and its treatment, suggest legislation for the government and assist in the planning of training programmes for people working in water management. An NGO concerned with a particular body of water is the *International Working Society of Danube Research* (0033) Vienna, Austria. The *Water Quality Institute* (0111), Denmark, with a staff of about sixty, carries out water quality surveys, researches waste water and its treatment, including industrial waste water problems. Sea water research is carried on by the *Biological Station* (0307), Blomsterdalen, Norway, and the *New York Ocean Science Laboratory* (0477), Montauk, USA. The Norwegian organisation has studied the marine ecology of Norwegian fjords in natural and polluted conditions, and the impact of a hydro-electric scheme on two fjords. The American organisation has carried out research which includes studies on the effect of DDT, and toxicity of trace metals in water. The *Department of Environmental Conservation, Helsinki University*, (0120), Finland, has carried out research on water pollution including research on pollution from mercury. Industrial air and water pollution is the main interest of the *Swedish Water and Air Pollution Research Institute* (0341), Stockholm. Their projects have included the study of methods for handling and converting solid waste, development of recycling and for low energy methods for external treatment of liquid and solid waste, characterization of risk-chemicals and their effects on health and the environment.

A community organisation with a salaried staff of two, *Aqua Viva* (0342), Bienne, Switzerland, acts to protect the waters and lakes, and the maintenance of their banks for recreation.

Technical information on the nature, collection, treatment and disposal of domestic and industrial waste water is developed and disseminated by the *Water Pollution Control Federation* (0494), Washington DC, USA.

Noise Pollution - Research into noise is carried out by various acoustical organisations, an example of which is the *Acoustical Laboratory* (0105), Lyngby, Denmark. They carry out research into motor vehicle, airport and building-site noise, land-use planning and internal and external ind-

ustrial noise. Industrial workers affected by noise pollution are the main concern of the *German Workers Unit for Noise Pollution* (0154), Dusseldorf. The *Luxembourg Noise Abating Society* (0261), Luxembourg, is concerned with noise as it affects both workers and other citizens. They campaign against noise, cooperate and exchange experiences with similar organisations, suggest and prepare administrative measures to stop noise, encourage the establishment and maintenance of zones of silence and rest. The *Dutch Noise Abatement Society* (0281), Delft, also plays a similar role for the Netherlands. Campaigning against noise at the international level is carried out by the *International Association Against Noise* (0005), Kusnacht, Switzerland. They coordinate and exchange information with other organisations, undertake research and publish a newsletter, hold meetings, and promote the establishment and maintenance of noise-free rest zones.

General Pollution Concerns - We mention NGOs in the following section (ii) which could be used as examples for this section. Their interests cover all kinds of pollution, including water, air and noise pollution. Waste disposal, waste reduction, recycling, efficient use of energy, and changing life-styles to reduce consumerism and its consequent wasteful use of resources - these are some examples of areas of concentration of such NGOs. One NGO which might serve as an example is *STOP (Save Tomorrow Oppose Pollution)* (0086), Edmonton, Canada. Where there were particular problems of uncontrolled pollution, they supported action to control it; for example, to improve air and water quality and to introduce necessary controls for pulp mill wastes. STOP is concerned that man's interaction with his environment should be 'balanced'. In their words, "STOP is committed to social and economic change to reach such a balance. Change based on a close study of ecology, economic factors, resource limits, political reality, and social and individual values". In taking an approach to see to the long-term needs of environmental quality and protection, examples of their activities include a public education campaign on conservation over two years, lobbying for law reform which would ensure environmental considerations were made in development programmes and support for industrial workers in their concern for worker protection in industry.

An NGO directly connected with industry and also coming under this heading is the *International Petroleum Industry Environmental Conservation Association (IPIECA)* (0398), London, England. Membership is open to any international or national petroleum enterprise or petroleum industry association concerned with production, transportation or refining of petroleum. They produce films and reports on air pollution, water, groundwater and soil pollution, noise control, oil pipelines, petroleum products - handling, use and disposal of used products. The petroleum industry also has a group which specialises in air and water pollution, *CONCAWE: Conservation of Clean Air and Water in Western Europe* (0280), The Hague, Netherlands.

Air, water and noise pollution have been the subject of studies done by the *International Iron and Steel Institute* (0046), Brussels, Belgium. The Institute aims to provide for free and open discussion of steel industry problems and in relation to the environment have produced a report on 'Environmental Control in the Iron and Steel Industry', and held symposia on the subject. In relation to noise pollution especially, they have examined the problem of the location of steel works. The work environment has also been the subject of studies.

The ecological effects of urbanisation and industrialisation has been studied by the *Institute of Terrestrial Ecology* (0394), Cumbria, England, in relation to pollution and its effects on various forms of plant and animal life.

(ii) Industrial Products and the Consumer:

Examples of the kind of issues citizens groups have campaigned on are - economizing on water, energy, paper and heat; recycling of paper, glass, metals; prevention of the development of nuclear power; production of plastics, dyes, detergents, insecticides, aerosol sprays, asbestos, fluorescent tubes. They often produce resource material and conduct campaigns in schools, and carry out research into industrial production of certain products and the waste and pollution involved. NGOs carrying out this kind of work are *Pollution Probe* (0081) Ottawa and Toronto, Canada; *Consumers Association of Canada (BC Branch)* (0516), Vancouver; *Hellenic Association on Environmental Pollution* (), Athens, Greece; *the Association Against Pollution (Arcadie)* (0343), Geneva, Switzerland; and *the Canberra Consumers Incorporated* (0010), Australia.

A service in environmental quality is provided by the *National Sanitation Foundation* (0472), Ann Arbor, USA. With a staff of sixty-one and most of their financial support from industry, the Foundation conducts research in standards development and provides an evaluation and listing service for products and equipment related to health and the environment. Manufacturers who voluntarily enter into an agreement with NSF must see that their products meet the standards laid down by NSF and have their products tested in NSF laboratories.

A research organisation, *Environmental Resources Limited* (0384), London, England, undertakes assessment of environmental impacts from industrial development, products and chemicals. It also assists in developing environmental standards, assesses the impact of environmental legislation on industry, undertakes technical market assessment studies for processes and products, conducts research on waste management and toxicological testing. The paid staff of twelve includes scientists, engineers, socio-economic and legislative specialists.

(iii) Health of the Community and Industrial Workers:

Community Health

In the field of analytical chemistry, the *Battelle Memorial Institute: Geneva Research Centre* (0344) Switzerland, has carried out research on contaminants in food and drink, including investigations of source of contaminants in food processing plants, mercury in fish, asbestos in wine and water. The Centre has a salaried staff of 500 and carries out many other kinds of scientific research, such as on textile production, wastes and recycling, energy production and saving.

The International Centre for Industry and the Environment (ICIE), (0135), Saint Germain-en-Laye, France, is an association of manufacturing industries, providing an interface between industry and the U.N. Environment Programme in order to, inter alia, facilitate contribution to this programme of managerial experience and technical information on toxic chemicals. The ICIE is presently working closely with IRPTC and the WHO Environmental Health Programme. Sources of industrial expertise are located and made known to the appropriate U.N. body.

The European Institute of Ecology and Cancer (0041), Brussels, Belgium, is concerned regionally to

identify and research sources of food contamination, water and air pollution. They publicise their findings mainly through organizing regional meetings where they work towards developing policies which protect the health of man through environmentally sound industrial development.

Handicapped Persons

Project Normalisation (0082), Quebec, Canada, is a citizen group which supports the development of appropriate resources for the objectives of normalisation of the handicapped in society. One aspect of their work is to see that products of industry used in, for example, schools and rehabilitation centres, are designed in a way that takes account of both environmental and handicapped-use considerations. Three large groups of NGOs who serve community needs, *The Lions*, *The Apex* and *The Rotary Clubs*, are often concerned at a local level with the needs of the handicapped for useful employment in industry. All these groups of clubs have branches in various parts of the world.

In addition to this, trade unions in particular frequently make provision for and protect the interests of workers handicapped while working in industry.

Occupational Health

The Royal Swedish Academy of Sciences (0339), Stockholm, publishes bi-monthly a periodical called 'Ambio', written in the English language. It reports on recent work in the inter-related fields of environment and the health hazards to workers in industry. Other issues have also contained articles related to the work environment and to pollution of various kinds from industrial sources.

The People's News Service (0411), London, England is another organisation which produces a periodical providing information on occupational health. This periodical has articles in newspaper format providing, among other topics, news on incidents in which health conditions in industry were affected.

A professional society, *The New Zealand Institution of Engineers* (0299), which has many members employed in industry, is concerned with a range of environmental issues in industry which affect its members and includes pollution from noise, air and water, as well as the use of energy, solid waste disposal, technology and water resources.

The International Primary Aluminium Institute (0399), London, England, has published information on occupational exposure to fluoride and health protection in primary aluminium production. The Institute has a paid staff of six which provides information on all aspects of the world's aluminium industry and includes the study of environmental health and safety problems affecting the industry.

Examples of trade unions which have programmes in occupational health follow: *Trade Unions International of Chemical, Oil and Allied Workers (ICPS)* (0170), Budapest, Hungary, have organised a seminar on health and labour safety and the protection of the environment, and have a number of activities associated with this. *The Norwegian Federation of Trade Unions* (0309), Oslo, is the main organisation for thirty-nine Norwegian trade unions. Among its concerns it ensures that working conditions meet standards acceptable to the workers and that provision is made to help workers who have to retire early or are totally or temporarily incapacitated because of accidents while at work. Similar functions

are served by the *Icelandic Federation of Labour* (0171), Reykjavik, Iceland. Another Scandinavian trade union organisation, *The Central Organisation of Salaried Employees* (), in Stockholm, Sweden, has carried out research on the working environment of its members in 24 unions with a view to negotiating for necessary improvements in working conditions.

A citizen group, *STOP*, mentioned in A (i) above, for example, joined with workers to research the dangers of asbestos, noise, sulphur compounds and carcinogens.

B. Employment Generation

In an attempt to develop a positive response to redundancy, the *Lucas Aerospace Combine Shop Stewards Committee* (0402) Burnley, England, drew up a plan for the production of 'socially useful' products by Lucas Aerospace in place of the armaments currently manufactured. There are 150 products in the plan with complete technical specifications covering the areas of: oceanics, telechiric machines, transport systems, braking systems, alternative energy sources, and medical equipment. The Plan was drawn up with the participation of the 14,000 employees of Lucas Aerospace at 17 sites and is designed to make possible the employment of all these workers and others who have been made redundant.

Although the Plan has not met with acceptance by Lucas Aerospace management, it has aroused enormous interest among trade unions and other organisations in Britain and overseas. Workers at other large British companies have begun to draw up their own plans along the lines proposed by Lucas Aerospace workers; for example, workers at Vickers, C & A Parsons, Clarke Chapman, Chrysler, BAC and Rolls Royce. Given the enormous interest in the Lucas Aerospace Corporate Plan, a support organisation has been set up in the North East London Polytechnic, the *Centre for Alternative Industrial and Technology Systems* (CAITS) (0379). The Centre acts as a clearing house for the Lucas Corporate Plan and promotes the development and application of socially useful products, makes this available to other groups; promotes design, development, prototype manufacture, production and marketing of 'alternative products'; assists in the development of more socially desirable, non-hierarchical organisational forms of industry.

A coalition of environmental groups, unions and other organisations in Australia is campaigning for socially and environmentally appropriate work. The campaign is called 'Environmentalists for Full Employment (Australia)' (EFFE), and is being co-ordinated through the *Australian Conservation Foundation* (0003). EFFE seek to suggest alternative job-creating proposals to overcome the current unemployment proposals but which do not involve escalating energy consumption or environmental abuse. "A central theme of our argument will be that capital currently ear-marked for environmentally harmful or resource wasteful projects such as uranium mining or increasing electricity generating capacity would provide much more social benefit, and many more jobs, if invested in alternative environmentally sound activities." A similar concern for creating job opportunities is expressed by *Friends of the Earth Limited* (0387) London, England. They are currently assisting their groups in England - of about 9,000 members - to take the steps necessary to join job-creation schemes and help develop them, with the consideration that the jobs be environmentally sound.

NGOs concerned with planned population growth frequently relate their arguments for slower population growth to employment opportunities. Such an NGO is the *Planned Parenthood Federation of Canada* (0080). The Federation has a paid staff of eleven and a membership of 80 organis-

ations. They have a variety of publications and audio-visual materials.

Two groups in the survey were concerned with creating job opportunities by developing small rural towns. The *Regional Resources Project No.1* (0083), Carbon, Canada, coordinates and promotes the development of ten small rural towns. Among its terms of reference is the establishment of local development cooperatives for the purpose of promoting, encouraging and assisting in the industrial, commercial, and residential development of the communities and their surrounding regions. As a result of this project, employment in industry is created and also in other sectors of the economy. The second group is the *New Villages Association* (0405), Evesham, England. They are planning to set up land-based villages where people can live and produce as much as possible of their own food, clothing and other necessities locally, and recycle their wastes. This project is based on considerations of environmental soundness for every activity to be carried out in the villages. It includes plans for small-scale industry which would be agreed on after considerations of: the need for the goods created, whether the industry met ecological standards to be set, that they should create a minimum wastage of resources and be labour rather than energy intensive. The Association was founded in 1974 and relies on the work of three unpaid staff and the support of 300 members. It is at present concentrating on obtaining the necessary capital and skilled personnel to set up the first experimental village.

C. Training and Education

The *Norwegian Federation of Trade Unions*, already mentioned, has general education courses and trade union training courses for its officers, works leaders and other employees on such matters as rationalisation, protective devices, productivity, economy and social questions. An organisation which provides general education, *The New Zealand Workers' Educational Association* (0301), Wellington, New Zealand, provides adult education to further individual and social development.

D. Industrial Technology

The *Japan Forest Technical Association* (0240), is a professional NGO concerned to develop the science and technology of forestry. Among their activities they provide information on the most suitable equipment for use by foresters and make this equipment available for sale to members.

BC Research (0065), Canada, is the technical operation of the non-profit, independent society, the *British Columbia Research Council*. It conducts research, development and other technical work under contract to sponsors both in industry and government. For example, in engineering physics, they have carried out studies in mechanics, heat and vibration, metallurgical and materials engineering; electrical, electronic, electro-optical engineering; and highway operations. In relation to section A, they have also carried out many studies on pollution and methods of combating this.

The *Battelle Geneva Research Centre*, mentioned earlier in section A (iii), also has interest in the development of industrial technologies such as incinerators for industrial wastes, graphic arts technology, development of new processes and equipment related to textiles, including cotton and viscose.

The Lucas Aerospace Combine Shop Stewards Committee, mentioned under B. previously, have designed 150 products, and other groups like their own with different technical skills are designing other products.

E. Ethics in Industry

A religious organisation whose members work in business and industry is the *Christian Union of Business Executives (Uniapac) (0039)*, Brussels, Belgium. Their activities raise the consciousness of its members about business and industrial issues which affect other people. For example, they have been concerned with environmental pollution from technologies used in the steel industry and with moral issues involved in international industrial cooperation, and which affect the environment. Another religious organisation, *The National Council of Churches (0471)*, New York, USA, appointed a panel of participants to produce a report on the implications of energy use and production in industrialized countries, evaluated in terms of proposed ethical criteria. This report covered the use of energy for industrial production.

There are also NGOs whose work brings them in contact with industry and who are concerned, from a point outside of industry, with ethical considerations of industry and the environment.

Jishu-Koza Citizens Movement (0241), Tokyo, Japan was established to combat pollution. They have become deeply involved in publicizing the moral as well as practical considerations of the bad effects of some industries and especially the export of polluting industries to other countries. They publish periodicals on pollution, organize conferences, make films and slides, organize public demonstrations, and carry out research as part of their attempts to draw public attention to such issues as Minamata disease in Japan and Canada, air pollution from Japanese steel plants in Japan and the Philippines.

In England, *Greenpeace (0392)*, has an unusual and dramatic approach to draw attention to the dangers of nuclear waste. They place their boats where ships are dumping radioactive waste into the ocean. Usually, they film, tape and photograph such events and publicise them through the mass media. This has stimulated public debate on the use of nuclear power for industry and domestic purposes.

Starting in 1970 as an environmental protection organisation, *The Natural Resources Defense Council (NRDC) (0475)*, Washington DC, USA, now has a team of qualified attorneys, scientists and environmental specialists who use legal action as their main avenue to protect the environment. They have become "a public watchdog over the implementation of important federal laws and policies affecting the environment ..." (5 year report 1970-1975). The issues on which the NRDC take legal action serve as the focal points for public education campaigns. NRDC attempt to keep in contact with industry: "We believe that a cooperative spirit between industry and environmentalists should be encouraged wherever possible"; however, many of the legal actions they take directly affect industry. For example, they have gone to court a number of times to ensure the enforcement of the Clean Air and Clean Water Acts by industry and in almost every instance the courts have been in favour of the NRDC. In addition to litigation, the NRDC has published two citizens' manuals - 'Action for Clean Air' and 'Transportation Controls for Clean Air' which have helped citizens and local organizations play an important role in keeping the implementation of the Clean Air Act.

2.2 Examples of NGO Activities in Developing Countries

A. Environmental Protection for the Community

(i) Pollution Monitoring and Control:

It is usual in the large urban areas of developing countries to find NGOs actively monitoring pollution from industries and attempting to draw attention to the need to prevent or minimize it. *The Consumers Association of Penang (0263)*, Penang, Malaysia, has carried out studies and public campaigns on water pollution from industries, drawing attention to the adverse affect on marine life and the livelihood of local fishermen and their families. Also in Malaysia, the *Environmental Protection Society (0265)*, Selangor, has studied water pollution from industrial wastes in the river passing through the capital city of Kuala Lumpur. The *Bombay Civic Trust (0180)*, India, has a number of projects concerned with urban industrial development around Bombay which threaten to cause a massive increase of pollution in the Bay. The Trust has been a major influence in the formation of a coalition of citizens groups to campaign and research more effectively, called the *Bombay Bachao Committee*.

In Latin America, the *Uruguayan Institute for the Preservation of the Human Environment (0501)* Montevideo, Uruguay, has carried out public campaigns which included the use of radio and TV to draw attention to the need for control of water and air pollution. Included in these campaigns was promotion of draft laws to reduce the likelihood of pollution. *The Association for Defense Against Environmental Pollution (0312)*, Lima, Peru, also conducts public campaigns through the mass media on all aspects related to industrial pollution including noise, water and air pollution. They support this activity by holding lecture series and seminars. *The Ecological Group of the University of Tolima (0094)*, Ibagu, Colombia, has studied and campaigned on various kinds of pollution from industry and one of their major studies concerned mercury pollution in water.

(ii) Industrial Products and the Consumer:

A research organisation concerned both for the industrial work environment and for consumer protection is the *Industrial Toxicology Research Centre (0201)*, Lucknow, India. Among their aims is to study the harmful effects of substances encountered in industry and "to elucidate the mechanism of tissue injury and suggest therapeutic and preventative measures". Examples of their research topics are: toxicity of dyes and dye intermediates, toxicity of plastics, epidemiological studies of health hazards in industries and mines, and toxicity of industrial gases. The *Papua New Guinea University of Technology (0314)*, Lae, Papua New Guinea, has carried out studies on the effect of pesticides on imported and local foods.

The Consumers Association of Penang (CAP), mentioned in A (i) above, has wide-ranging activities and will enquire into anything which reportedly has had adverse affects on the consumers. They do not have their own research laboratories but they have access to experts in various scientific and technical fields, and they will check reports coming to them as thoroughly as possible. An example of this approach used by CAP concerned medicinal pills which were produced locally and reported by certain university tests to be dangerous to human health. Government tests contradicted the university findings but no explanation was made as to how the results could be so different until CAP made enquiries and publicized both results, pointing out the need for caution in using the pills while test results were inconclusive.

B. Employment generation and industrial development

The Grissa Organisation for New Life (0216), Angul, India, is an example of an NGO which has stimulated village industry in their local area. They aim to assist poor farmers to organize in a way that follows Gandhian principles and makes the village economy "self-sufficient, enlightened and efficient". They have successfully founded a spinning and weaving industry in their area and an enterprise to process agricultural products. An NGO which has been very successful in Africa in generating employment is the *National Christian Council of Kenya (NCCCK)* (0252). They now have a number of projects in poor areas to generate employment by the production of such articles as toys, pottery, furniture, clothes, household goods, rope mats, etc. One of these projects involved the production of toys known as Furaha Toys. The toys are produced in a factory situated in a densely populated shanty area on the outskirts of Nairobi. The project was established with some of the following aims: a. To provide employment to those in greatest need; b. To provide it in such a way that it benefits only the employees; c. To get money into the workmen's pockets as soon as possible; d. To help workmen to participate in decision-making as much as possible.

With minimum capital input, using workmen and women who came with no qualifications except that they were the most needy selected by the NCCCK social workers, the project managed to pay for itself, train on-the-job and provide employment continuously for more than 50 workers. It has now been in operation for eight years. This project, as well as the other similar ones carried out by NCCCK, has had a marked effect on the lives of those employed and their families, changing and improving their food consumption, the quality of their housing, their opportunities for education and their health.

Oxfam (0409), Oxford, England, frequently provides money to organizations attempting to set up employment generating projects in the form of small-scale industries such as a handicraft workshop, a poultry scheme, a bamboo-use cooperative, development of appropriate technology.

Chambers of Commerce such as the *Chamber of Commerce and Industry of Malawi* (0262), *The Singapore Chinese Chamber of Commerce* (0330), are both national NGOs whose main aim is to promote commerce and industry in their countries. Their activities include such interests as the social and economic factors associated with industry, pollution and community service. A regional body supporting similar interests is the *International Chamber of Commerce Commission on Asian and Pacific Affairs (ICC-CAPA)* (0375), Bangkok, Thailand. In the interests of development for the State of Karnataka, India, *The Institute of Development Studies* (0202), Mysore, India, has carried out research related to planning for industrial development. In their research they attempt to consider all important environmental factors including those which are socio-economic. In Africa, an institute in Enugu, Nigeria, *Projects Development Institute (PRODA)* (0305), carries out research and development on industrial development for Nigeria. Their projects have included the development of cheap solar-heaters and solar driers for agriculture which can be manufactured using local personnel and resources.

In Botswana there have been several attempts at developing village level industry in what is known as Brigades, using an ecodevelopment approach where those in various Brigades in a community live together and make an almost self-sufficient community, while at the same time training and educating the members of the community in the expectation that they will be able to earn incomes on com-

pletion of their training and remain in the local area. An example of such a Brigade system is the *Kweneng Rural Development Association* (0053), Molepolole, Botswana. Examples of their activities are the Biotshoko Centre, training staff and producing garments; the Thusanya Workshop and Bua Limited, where uniforms are produced on a cooperative basis and the staff are completers from Biotshoko Centre; a forestry programme which includes tree-planting and pole production and is related to erosion control, conservation and other extension work; Bakwena Building Suppliers is related to a Brigade which trains students in the building trades and commercially transports, manufactures and retails building materials; Boikanyo Mechanical and Engineering Programme for training also provides essential technological support in the maintenance of machinery and vehicles, and carries out light engineering; they also do work in wildlife conservation. *Pelegano Village Industries (PVI)* (0054), Gabane Village, Botswana, is a community organisation set up to initiate an integrated community uplift programme based on rural industries. The objectives of this NGO could well place it also in the category of NGOs active in employment generation. "PVI's main thrust is towards helping the poorest families in the rural areas. Special emphasis is given to family centered income-generating activities, much of which can be undertaken at home ... PVI is establishing model village industries to demonstrate that opportunities for economic advancement are available in a village context". An example of one of their programmes is the poultry industry which farms poultry, uses backyard broiler units, a poultry slaughter unit and a marketing network all undertaken by villagers.

More information on employment generation as it relates to the development of Environmentally Sound and Appropriate Technology can be found in the chapter on that topic.



C. Training and Education

COSTED (Committee on Science and Technology in Developing Countries) (0187), India, has a programme entitled 'Identification and Preparation of Educational material for improving the rural environment' - part of which includes educational material on small-scale industry and energy. Their Appropriate Technology Information Service also provides technical information through news bulletins, slides, films and illustrative pamphlets in local languages.

The Mauritius Society for Environment and Conservation (0273), Phoenix, Mauritius, is mainly a youth group which educates on environment and development through talks, competitions, debates and rallies rather than through publications. Their interests include agriculture and industry.

INDUSTRY AND ENVIRONMENT

Training courses for managerial level executives in business and industry are often provided by non-government organisations with funding from industry and business. These organisations frequently also provide a practical consulting service to industry. Two African organisations providing such training and consultancy services are *The Nigerian Institute of Management (NIM) (0304)*, Lagos, Nigeria, and *The Institute of Development Management (IDM) (0368)*, Morogoro, Tanzania. "Business and the national economy are undergoing critical transitions. These transitions involve not only scales of activity but also roles of various institutions and their patterns of transaction. Managers and administrators are thus faced with new and emerging demands to which they need to respond creatively and effectively". These words, written by a member of staff of NIM could apply not only to Nigeria but to other developing countries in the region. NIM provides a variety of courses over the following areas: Production, finance, marketing, personnel and general management. The Institute runs courses in major urban centres of Nigeria as well as in Lagos.

Opportunities for industrial workers to receive training are quite frequently available through trade unions. An example is *The Pakistan National Federation of Trade Unions (PNFTU) (0310)* Karachi, Pakistan, whose members come mainly from the petroleum, chemical, steel and textile industries and which provides leadership courses.

Another NGO in Asia, *The Xavier Institute of Social Service (0228)*, Bihar, India, provides training at various levels related to development. Their courses take place in the Institute and also in the villages and urban areas. Training in social service is provided, including personnel management and industrial relations; there are also entrepreneur development programmes (general and tribal), and extension courses for trade union members. Using the Paulo Freire method of "conscientization" of industrial workers they are developing a model to be used in industry in coping with problems affecting the work of the employees but which are related to the general living conditions of factory workers. Training and education on the development of small-scale industries has also been provided to project leaders from the Institute through visits to small-scale industrial projects.

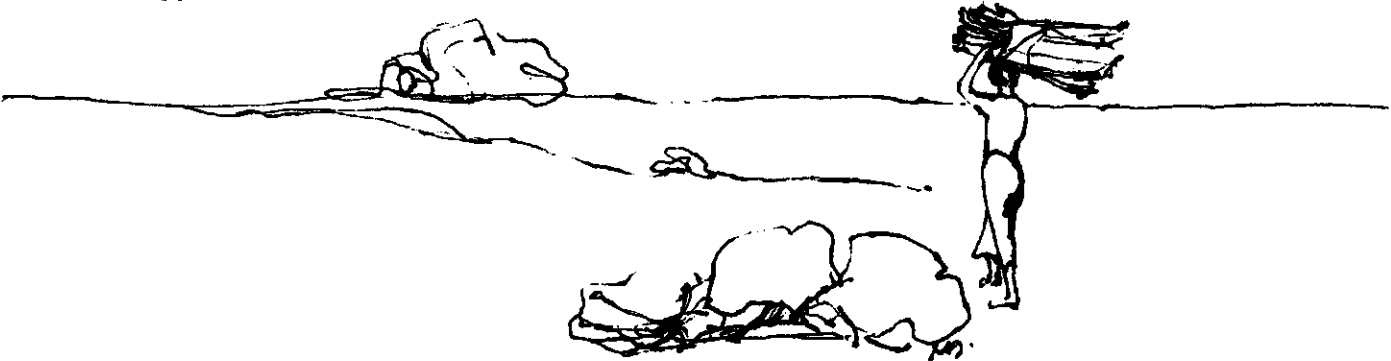
Another NGO working to support the development of small-scale industry is *Caritas Internationalis (0235)*, International Confederation of Catholic Organizations for Charitable and Social Action, whose headquarters are in Rome, Italy, but which works through a network of members all over the world. *Caritas Bolivia*, a member of the international network has a project with several other organisations training women in dress-making and having as one of the objectives the setting-up of garment-making cooperatives among those trained. The trainees consist of young women from some thirty village communities who become trainers themselves of other women in their villages. The training includes rudimentary health education. Another organisation providing training for women and girls is the *Sri Lanka Women's Conference (0335)*, Colombo. Training for small-scale industry is also provided by the *Pelegano Village Industries of Botswana*, mentioned previously. In their poultry farming, slaughtering and marketing programme, farmers not experienced with chickens in captivity are trained on how to manage this.

The Institute for Small-Scale Industries (0321), Quezon City, Philippines, aims to help train personnel in small and medium scale industry. They have formal and informal training programmes, a placement service and also assist in the establishment and running of these industries.

A developed country organisation, *The Center for Exchange and the Promotion of Craftsmen in Zones to be Equipped (0125)*, Paris, France, provides training assistance to developing country craftsmen. They have, for example, provided assistance in constructing solar ovens using local materials, improved technology for producing butter, jam, sugar and founded a confectionary for honey-made sweets.

D. Appropriate Technology for Industry

Examples of NGOs involved in this area are included in the chapter entitled 'Environmentally Sound and Appropriate Technology'.



1.1 GENERAL STATEMENT

Perhaps the differences in NGO orientation between developed and developing countries become most evident in the field of energy.

In developed countries, energy is a prime concern of a great number of NGOs, both directly - as a specific field of interest - and indirectly - as an aspect related to environment and development matters.

In these countries, energy considerations are no longer confined to the scientific elite, but have become a matter of concern for citizen groups, educational organisations, groups dealing with the protection of the environment, trade unions and consumers, in addition to academic and research workers, politicians and decision-makers.

Two visions of the energy issue in developed countries were clearly synthesized by the Energy Ethic Consultation, held in New York, October 1977, sponsored by the *National Council of Churches (0471)* New York, U.S.A. The first one states:

"The energy problem is essentially a problem of developing new supplies and/or technologies to meet the demands of a growth-oriented consumer society; simultaneously, conservation technology needs to be adopted to reduce wasted energy."

The second:

"The energy problem is but one manifestation of a far more fundamental crisis, involving nothing less than the basic assumptions and goals of all industrialised societies. Radical changes in values and institutions must be made to avoid global catastrophe."

These two preoccupations highlight the developed-country NGOs' concerns regarding energy matters. Some see the energy problems as a matter of improving and developing present and future supplies and technology in a safe manner, to meet the demand, both of particular societies and the world. The means for achieving this end are to undertake conservation policies and technologies to reduce energy waste, and at the same time, harnessing renewable resources of energy. NGOs in this category are either engaged in research or promotion of a particular source of energy or energy conservation of a particular source of energy or energy conservation devices, or are involved in other energy impact, nuclear energy considerations, etc.

Other NGOs are more concerned with reducing the growing energy consumption in the world, as a part of the industrialised life-style and the pattern of development adopted by the high energy consuming countries. One North American NGO, *Friends of the Earth (0455)*, San Francisco, U.S.A., pointed out that if per-capita energy use in the USA were reduced to that of, say, France, the amount 'saved' would suffice to give everyone else in the world nearly a "fourth" more energy than he now has. Likewise, it is said that 200 million Americans use more electricity for air-conditioning than 800 million Chinese use for everything.

The World Council of Churches (0364), Geneva,

Switzerland, affirm, in relation to the same subject: "In most of our developed countries, we use more energy than we should, and we use it less well."

Table 1 (page 55) gives detailed figures concerning energy consumption in some industrialised countries.

Table 2 (page 55) provides a broad vision of energy consumption in developed countries and developing countries, according to population distribution in both regions.

1.21 General Trends in NGO Activities in High Energy Consuming Countries

NGOs in high energy consuming countries are deeply involved in energy matters, the following are the two main trends in their concerns:-

1.211 Considerations of the global implications of the energy issue

Energy is viewed as the cornerstone on which industrial civilization has been built. Signs of the end of the oil era, marked by the energy crisis, has concentrated efforts on the research of energy resources and options, considering the actual and future global energy demand as part of a complex system of interactions: patterns of development; life-styles and patterns of consumption; characteristics of the process of industrialization and urbanization; priorities and goals of the affluent society. Together with these considerations are those relative to population growth, use of natural resources and environmental impacts, conceived in relation to world outer limits.

NGOs in this category are currently involved in methodological and technical aspects permitting an integral and multidisciplinary approach to the world energy situation and to the forecast of future alternatives to energy demand. The development of global models and particularly, the construction of global scenarios, where alternative energy options are considered, are being developed by some NGOs, providing a scientific basis for new energy strategies.

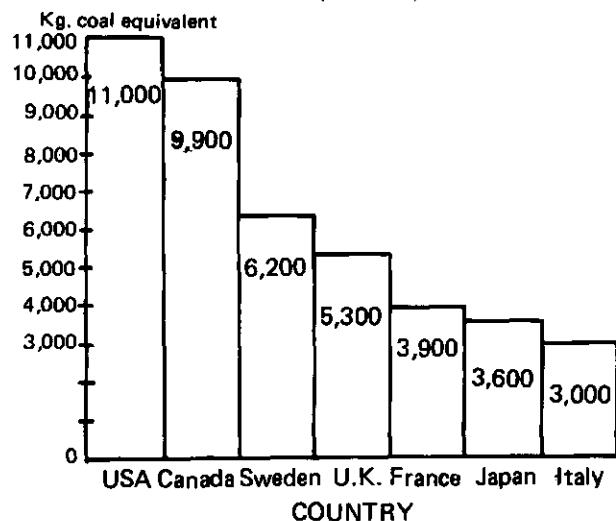
1.212 Energy issues in relation to particular concerns or specific strategies

A. Harnessing renewable resources of energy

This is an area of involvement of a wide range of NGOs throughout this group of countries, being mainly research NGOs, some of which intend to provide the scientific foundation for the transition to renewable energy, carrying out research and disseminating information on diverse energy options: direct solar radiation, low grade solar thermal energy, solar thermal

Table 1
Energy Consumption per capita
(Kg. of coal equivalent)
INDUSTRIALISED COUNTRIES

Source: World Development Report.



electric generation, photovoltaic conversion; wind energy, biomass energy; tidal power; wave energy, ocean thermal energy; geothermal energy. The establishment of networks of institutions concerned with the use of renewable resources of energy, or the construction of renewable energy scenarios, oriented to particular nations or region has been undertaken by several NGOs, such as *Friends of the Earth* (0455), San Francisco, U.S.A., *Energy Probe* (0074), Toronto, Canada, etc.

Solar energy developments have been particularly stressed in the developed countries either concerning specific applications such as generation of electricity, architectural purposes, heating and cooling, industrial utilisation, or in relation to solar options in general, as a means of meeting a large part of the energy needs, considering solar energy input by regions, solar technology for mass production, storage and transport techniques, environmental impacts, economic cost and the possibility of the solar option becoming competitive in the market.

Energy potential in biomass conversion is also widely stressed by NGOs. For example, research is being carried out on investigating the feasibility of obtaining a large-scale alternative liquid fuel option, based on the production of methanol from biomass and natural gas.

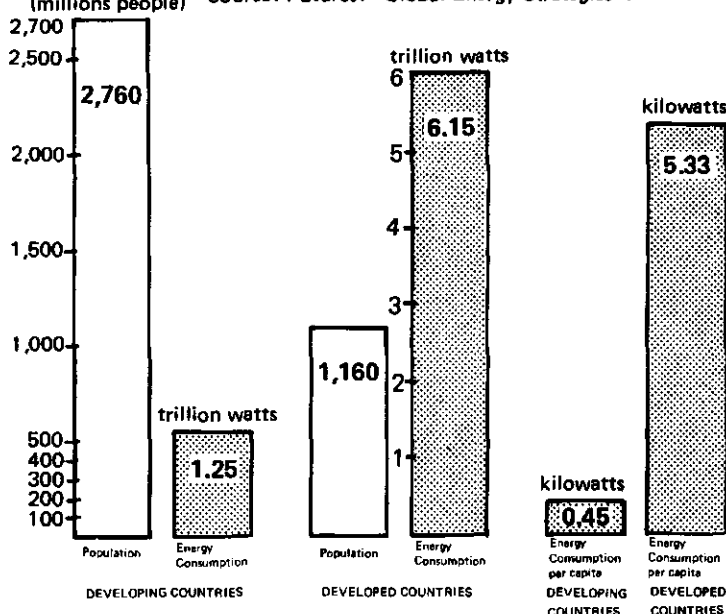
Research and development of small-scale energy technology is undertaken in the developed world to meet the energy requirements of rural areas in both developed and developing countries. These projects presuppose an identification of village energy end-use tasks and renewable primary energy availability, along with cultural life patterns which can facilitate or act as constraints on energization programmes. According to the *Soft Energy Notes*, published by the International Project on Soft Energy Paths, (*Friends of the Earth International*, San Francisco, U.S.A.) at least five types of renewable village technologies seem to be already competitive with other forms of electricity production: photovoltaic power generation, small-scale hydropower, biogas, windpower and flat-plate solar collectors. Other small-scale energy developments are oriented to heating and cooking, water pumps, food driers and small industrial processes.

B. Energy conservation and efficiency in fossil fuel utilisation

This topic is widely stressed by NGOs, both at a

Table 2
Population and Energy Consumption (1974)

Source: Futures: "Global Energy Strategies".



public level of involvement through mass campaigns, publications, pamphlets, dissemination of information in handbooks and manifestos; pressing legislative spheres for new energy policies; and at a technical level by providing standards for preventing energy waste in building and construction, in the industrial process, in transports, etc.

Wider awareness of the need for energy conservation - saving energy, using it more efficiently and eliminating waste - is promoted at domestic-consumer level with measures, such as insulation, use of lower temperatures, selecting lower energy-consuming appliances, avoiding goods packaged excessively, choosing less refined and processed foods and trying to recycle much of the household wastes. Through the elimination of wasteful and inefficient energy use, an unwarranted growth in demand can be reduced without changing life-styles substantially. Conservation campaigns also extend to industry, private transport, commerce architecture, intensive agriculture and utilisation of non-recycled materials.

This approach to energy-conservation is widespread in North America, Europe and Australia.

C. Decrease in energy consumption

The decrease, or de-escalation, in energy consumption is an energy strategy adopted by most NGOs on the assumption that overall energy consumption should not grow faster than the increase in population (more technically known as Zero Energy Growth per capita). An additional assumption is that energy waste should stop, so that the amount of work done by people in terms of energy consumed will increase, even though the total amount being used per person remains constant. This is part of a whole conception of life-style - "the conserver society" - looking for new parameters for social and economic development in the context of reduced energy and other resource demands.

D. Environmental Protection and Conservation

This area includes NGO interest in environmental impacts due to the energy fuel cycle, at local and national level as well as worldwide. This last aspect is stressed mainly in relation to climatic changes, particularly the alter-

ation of the heat balance in the atmosphere by the addition of trace gases, such as water vapour, methane, chlorofluoromethanes and carbon dioxide, released into the atmosphere in large quantities as one of the major combustion products of fossil fuel: coal, gasoline, fuel oil, natural gas, etc.

Other risks pointed out by NGOs are related to the transport of some fuels, such as the marine carriage of liquified natural gas. If spills occur near the Arctic, it could affect the reflectivity (albedo) of large areas of the Arctic pack ice, producing profound and irreversible changes in world climates.

These risks, having a world dimension, sometimes are faced not only from the technical point of view but also in connection with moral and ethical implications which involve scientists, politicians, and decision-makers in general, as well as the ordinary citizens.

Many NGOs concerned with protection of the environment, preservation of the ecological balance, conservation of some species and/or protection of life-supporting systems, are concerned with the negative impact of the production, transportation and consumption of energy. Currently, they are concerned with some forms of energy production, such as hydro-electric dams, offshore drilling, coal-thermal, high sulphur oil thermal plants. Other NGOs are more concerned with the side-effects of the use of energy, concentrating their efforts on pollution due to stack emissions, transport, heating, industrial processes, etc.

In fact, all the stages of the energy fuel cycle draw the attention of NGOs, some being more concerned with specific parts of the process. Their way of dealing with the problem may vary from a technical/scientific approach to a mass involvement in energy concerns. Frequently, technical NGOs are interested in dissemination of information and in making information more comprehensible to the ordinary citizens, facilitating in that way a deeper concern and participation in topics related to energy.

E. Nuclear power considerations

The nuclear option is a highly charged topic among NGOs, the majority of them working to protect the environment against the negative effects of nuclear power generation. Arguments cover a wide range of subjects, particularly those related to radioactive contamination, high costs, the political and social risks of weapons proliferation, and the inability of nuclear technology to meet energy requirements in developing countries. An intense debate is running on the theme of the environmental impacts of nuclear energy, associated with ionizing radiation, mining and milling of uranium ores, fuel enrichment, reactor fuel fabrication, nuclear reactor operation, reprocessing plants, nuclear waste storage, and transport of radioactive materials from stage to stage. Special emphasis is given by NGOs to the location of reactors when situated near urban areas. They usually try to discourage such location of plants. Currently, there are many NGOs working to mobilise mass participation and to influence policy and legislation concerning nuclear issues.

Questions of an ethical character are also raised in connection with nuclear power generation. Hazards of synthetic mutagens, or irreversible changes in climates and in soil fertility; thermal pollution, loss of coolant accident - these are all risks, together with the increasing possibility of a nuclear war. These hazards are pointed out by NGOs as involving the destiny of mankind.

Finally, there are NGOs carrying out research on cost-benefit analysis, assessing environmental impacts of nuclear power generation and determining benefits derived from its utilisation.

F. Job Generation through Energy Policies

Another matter of concern for NGOs is the relationship between energy use and employment generation. As Barry Commoner of Centre for Biology of Natural Systems, Univ. of Washington states: "It is imperative that society combines socially useful employment for all, the wisest use of appropriate energy and resources which will generate both maximum employment and at the same time guarantee a habitable environment." Commoner's statement seems to be, for some NGOs, the counterpart of energy policies that "promote large-scale energy systems, technologically complex, costly, wasteful, environmentally destructive and dangerous to energy industry employees and the public." *Environmentalists for Full Employment (0453)*, Washington, U.S.A., also said that the increasing replacement of employees by machinery and human labour by energy, leads them to believe that energy growth with associated prosperity and jobs, is a myth. Attention is drawn to the energy policies that create a maximum number of jobs and to the selection of energy technologies that can meet both energy requirements and employment needs. NGOs point out that energy conservation measures and an expanded use of alternate energy sources have more impact as job generators than nuclear programmes, dams, coal thermal plants. Solar energy, as a new industry, can provide a vast number of jobs for construction workers, metal workers and other industrial workers. Along with these considerations are those related to a decreasing dependence on foreign oil and on the possibility of generating more decentralised sources of jobs, run by solar systems in geographically dispersed areas.

1.22 General Trends in NGO Activities in

Low Energy Consuming Countries

There is a difference shown in the interest regarding energy issues in developing and developed countries. In developing countries, one of the main sources of energy is firewood which presents a double environmental problem. First, it is a natural resource, providing people's energy needs, mainly heating and cooking. Secondly, the tree, which provides the firewood is an integral part of the ecosystem preventing soil erosion, providing wood for construction and providing food and protection for herds.

The NGOs in developing countries are having to develop programmes to renew tree resources which have already been cut and to provide cheap and reliable alternatives which can be used in the rural community as firewood begins to fail to meet the increasing demands. The most successful alternative source is the production of bio-gas for human, household and farm wastes. Others include solar and wind sources.

Energy to improve basic needs supply and the opportunity to generate income is often treated at a local and household level by NGOs rather than as a regional or village issue. It is governments which are more usually involved in electrifying the rural areas for example, but NGOs may assist in small scale projects which help the local farmer or the women of a village by reducing their work load because of using a renewable energy source in place of charcoal or human energy for such tasks as cooking, drawing water and irrigating a field. This approach to energy by the NGOs has a particularly good

effect in that it gives the users much more control over their energy use. The technology can usually be repaired in the village and the user can understand enough about the source of energy, such as the sun or wind, to utilise it as needed and adapt to it in a way that suits his way of life. This is very different from the effect of supplying electricity for example which can be very helpful but is relatively out of the control and understanding of the user.

Regarding the new energy sources, the developed country NGOs are working with those in the developing countries to explore the possibility of some of these being used to meet the needs of the people there.

A. Afforestation and Reforestation

The first concern of NGOs in developing countries is to plant trees, millions of trees, all kinds of trees, and educate their communities to the need to treat them as renewable resources for harvest, cultivation and management; not just for cutting, exploiting and leaving. Community groups of all types are involved, from women's organisations, youth groups, churches and service organisations. More often than not, they are working in close cooperation with governments, where governments help provide the seedlings, transportation and other necessary infrastructure and the NGOs provide the manpower, drive and education.

B. Bio-gas

Bio-gas is appearing as one of the most viable alternatives to meeting the needs of the rural developing country people. China is leading the way with over 7 million bio-gas plants in operation. It is followed by India with some 36,000. NGOs are promoting the development of bio-gas plants in their regions. They have built pilot project plants, developed information sharing programmes and are pressing governments and aid agencies to put their energy dollars into bio-gas.

In some regions, the use of bio-gas is not well accepted due to the need to handle, at times, excrement from humans and animals. NGOs are undertaking education programmes to reduce the fears of the people and the adversities it causes.

NGOs have also begun to learn that bio-gas production has side benefits, the major one being that communities are becoming healthier as a result of human and animal wastes being collected and digested in gas plants, rather than being allowed to enter the community water supplies and plague the community living area, as has traditionally been the case.

C. Solar, Wind, Geothermal and Small Hydro-electric Renewable Energy Sources

NGOs in developing and developed countries, both, are working on these energy sources for developing countries. Some are for providing electricity, others are to provide mechanical power for use in farming and small industries and others are for direct heating, not only for homes, but for drying crops for storage and milling.

D. Environmental protection and conservation

As developing countries begin to adopt Western consumer patterns, they must have the massive

power sources to support them, which brings with it the exact same problems faced by the NGOs in developed countries - hydroelectric dams, thermal pollution and noxious air emissions, nuclear power plants, etc.

Coastal countries in the developing world have a special problem which NGOs are addressing themselves to: their coastlines and fisheries are being ruined by oil spills from supertankers transporting energy to developed countries. The coastal countries are being contaminated by an energy source which is not destined for, or being used by them.

2.1 EXAMPLES OF NGO ACTIVITIES IN HIGH

ENERGY CONSUMING COUNTRIES

2.11 Considerations of the global implications of the energy issue

At the *International Institute for Applied Systems Analysis (0032)*, Laxenburg, Austria, about 100 scientists are engaged in the investigation and search for optimal ways of solving large-scale problems of modern science and technology which affects the destiny of humanity. Scientists from many nations and many disciplines work together facing global problems through an interdisciplinary and integrated approach. Such an approach requires a new analytic tool - systems analysis - directed at identifying all the relationships and interactions of phenomena involving the application of logical, mathematical, computer and organisational tools, and utilising modelling as a means of analysing complex systems, facilitating the unification of the conceptual framework, the elaboration of standard research procedures and formulation of scientific language.

Among the problems of a global nature, IIASA is carrying out a project on Energy Systems. Research concentrates on the problem of furnishing future societies with sufficient amounts of energy, in particular, on the strategies for transition fifteen to fifty years from now to an energy system that uses essentially inexhaustible energy sources.

Another NGO in the U.K. produces '*Futures*' (0390), Guildford, which is an international journal of forecasting and planning concerned with the future in an increasingly complex world. The study of futures spans several disciplines including energy and draws together articles and information on pure and applied research, methodology organisation, and developments in the study of the future.

The *International Institute for Environment and Development (0397)*, London, U.K. has a programme currently focussed on the energy problem in U.K. It is assessing the potential of energy conservation and renewable sources offering a longer term solution to the energy problem. The major aim of the project is to provide a sound factual basis for opening a wide, sustained and informed public debate on alternative energy strategies. The Institute states: "There is still a marked imbalance in the research and financial commitment to these (conservation and renewable energy) alternatives. Most effort still goes towards increasing supplies through coal, nuclear and other conventional sources. While now fashionable, energy conservation and renewable sources are still a remarkably under-researched area. The aim of the project is to see how attractive these "soft" options might become if they were to

enjoy policy and financial commitments comparable to those given to fossil fuel and nuclear electricity."

The IIED Energy Programme has produced some surprising results. For example, an analysis of the domestic housing sector in the United Kingdom found that by 2025, it could be using one fifth less fuel with one fifth more households - a forecast very different from that suggested by traditional forecasting techniques.

The *Institute of Man and Science* (0462), Rensselaerville, U.S.A., is involved in a major project for the US Energy Research and Development Administration (ERDA). The aim of the project is to develop a preliminary impact assessment of ERDA's solar energy programme. The project consists of a series of "Energy Scenarios" regarding projections of US energy needs up to the year 2000 and ways of meeting these needs, giving regard to the related social, economical, technological and environmental impacts.

Friends of the Earth (0455), San Francisco, U.S.A., and sister organisations of the same name in other countries, are working for a more rational use of energy. They publish books and a periodical "Not Man Apart", which includes a regular section on nuclear power generation - "Nuclear Blowdown". Among their publications are the books "World Energy Strategies" and "Non Nuclear Futures" by Amory Lovins which contains a complete store of information treated in the world context and from an integrated point of view.

2.12 Energy Issues in relation to particular concerns

A. Harnessing Renewable Resources of Energy

Canberra Consumers Inc. (0010), Australia, is involved in lobbying for energy labelling of domestic appliances. They published information on solar heating systems in 1977.

International Solar Energy Society (0017), Melbourne, Australia, fosters the science and technology of the application of solar energy, encouraging basic and applied solar energy research and development. They promote education in this field and are concerned with gathering, compiling and disseminating information on all the aspects of solar energy. The Society produces a monthly Scientific Journal "Solar Energy", and a quarterly magazine "Sun World". The parent society holds an International Congress every two years.

Solar Energy Developments (0418), London, U.K., is involved in research and development in solar and alternative energy systems, in particular as applied to architecture. Among their projects is the development of collecting, storing and distributing systems for solar energy showing interest in "passive" solar systems and in wind and wave energy.

The International Association of Volcanology and Chemistry of the Earth's Interior (0396), Dept. of Geology, University Park, Nottingham, U.K., has an interest in geothermal power. The organisation sponsors meetings on the issue and also has a working group concerned with hot springs.

Cxtrike (0410), Oxford, U.K., is involved in the use of heavy molecular weight vapours as working fluids in vapour power cycles for solar energy utilisation and waste heat utilisation. They have also designed a wind-driven heat pump.

The *Green Ban Action Committee* (0391), Birmingham, U.K. is oriented to the fostering of contacts between environmental groups, trade unions and labour movements, and promoting the development of environmental consciousness by workers. In relation to energy, they act by advocating, through the Trade Unions, energy sources and conservative techniques which would be alternatives to nuclear power.

The *Intermediate Technology Development Group* (0395), London, U.K., has power projects in different areas: small-scale hydroelectric generation pumping; windmills for water pumping; methane generation; bio-gas and wood-fuel conversion, etc., oriented to developing countries' energy supplies.

The *Natural Energy Centre* (0404), Surrey, U.K., promotes and develops a range of products which use natural energy as their primary source of power and so help to conserve the diminishing reserves of fossil fuels. They have been responsible for the design, supply and placement of some of the largest solar panel installations in Britain, as well as of numerous wind-driven generators and heat pumps.

The *Organisation for Renewable Energy* (0110), Copenhagen, Denmark, is involved in energy policy in Denmark, based on environmental concerns and resource conservation, and an appropriate soft energy technology, which stresses decentralised, self-sufficient energy supply systems based on renewable energy sources. In addition to the above, OVE conducts surveys on problems incurred by persons involved in building solar collectors, wind generators and methane gas generators.

The *French Federation of the Societies of Protection of Nature* (0132), Rochefort, France, promotes the diversification of energy sources and research on soft technologies.

The *International Real Estate Federation* (0141), Paris, France, is interested in energy considerations in the planning and development of human settlements.

The *International Ocean Institute* (0268), Msida, Malta, coordinated and oriented the UNESCO small-island energy project, attempting to stimulate the energy input into the island of Gozo from non-renewable sources of energy. The object is to estimate to what extent, if any, some of these energy requirements can be met from renewable sources, such as solar, wind, wave or chemical energy.

Electro GmbH (0348), Winterthur, Switzerland, is concerned with the construction and manufacture of Pelton turbines, wind power generation, for electricity production, from 50 to 10,000 watt.

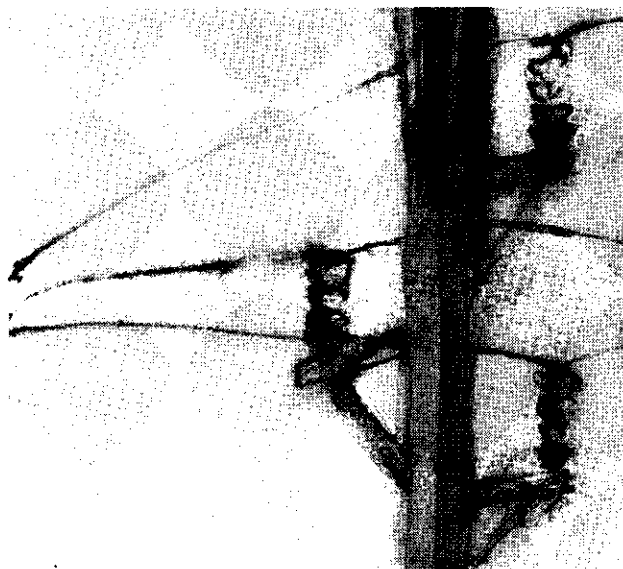
The *Institute for Building in the Tropics* (0155), Starnberg, Federal Republic of Germany, has a collection of published material on alternate forms of energy with the view of reducing pollution and cost.

The *International Working Group for Sport and Leisure Facilities* (0157), Cologne, Germany, is interested in research and demonstration projects for rational use of energy, energy recovery and for solar energy techniques in sports and swimming-pool facilities.

Niels Bohrs Institute (0109), Copenhagen, Denmark, is interested in renewable energy systems, particularly direct wind and solar conversion. Comprehensive systems of simulation and optimization at national as well as global level have been built. The main objectives are conservation and long-range energy planning, again at national and global level.

Laboratories for Energetics (0108), Lyngsby, Denmark, is doing research on Energy Systems. Among their projects is the storage of thermal energy, an investigation of storage and warm water in aquifers in the ground. The investigation includes mathematical models for the study of the conditions in aquifer-storage units. Preliminary investigations are now under way to lay the basis for this establishment of a pilot storage unit in Denmark.

The *Batelle Memorial Institute: Geneva Research Centre* (0344), Geneva, Switzerland, devoted a substantial portion of its work on energy and fuels from renewable resources and in energy conservation in the existing systems. They carried out several studies on the use of soft technology (solar, wind, biogas).



The *Institute for Environmental Research* (0031), Graz, Austria, holds an eminent place in solar energy research in Austria, and in 1975 was given the Austrian National Award for Energy Research. The first solar collector to be manufactured commercially in Austria was the result of the Institute's work.

The *Murray Valley Development League* (0018), New South Wales, Australia, educates people on the developmental and conservation realities and needs of the region. The organisation is advocating the collection of brine in salt-gradient ponds which they believe can be made to absorb and make available solar energy.

Alternative Sources of Energy (0426), Milaca, U.S.A., is the publisher of "Alternative Sources of Energy" magazine. Its purpose is to encourage the development and use of renewable energy sources and methods of energy conservation.

The *Ecology Centre* (0447), Berkeley, U.S.A., undertakes research on the feasibility of using renewable energy sources within the community, and to demonstrate alternatives to the ecological crisis.

The *Center for Habitat and Human Settlements* (0437), San Francisco, U.S.A., is developing the International Solar Development Center, promoting an environmentally sound use of energy, compatible with an increasing energy conversion rate and an expanding industrial system.

Toledo University (0488), Toledo, U.S.A., has constructed a demonstration Solar House on the University campus, and uses it to teach solar technology and to investigate mass application of solar energy in homes in the U.S.

Association for the Safeguard of the New Caledonian Nature (0394), Noumea, is promoting the use of small dams to generate electricity and promoting the development of solar energy.

B. Energy Conservation and Efficiency in Fossil Fuel Utilisation

Kananaskis, University of Calgary (0077), Alberta, Canada, is involved in research in different aspects of energy and energy conservation in small commun-

ities. They sponsored, together with the Calgary Inter-Faith Action Committee, the publication of "Energy: Rights and Responsibilities".

Action for Environment (0295), Wellington, New Zealand, puts forward the views of ordinary citizens and orients them to take responsible action in environmental protection. They organised public forums on energy conservation and energy futures, becoming involved in the whole area (alternative and non-renewable resources, transport, conservation). Among other tasks they have made submissions to the Royal Commission on Nuclear Power Generation.

The *Community Planning Association of Canada* (0071), Saint John, is a regional organisation of 20 active members, and is concerned with the promotion of energy conservation at the local level, as well as with the utilisation of appropriate technology. They produced various publications and audio visual material.

The *New Zealand Branch of the Clean Air Society* (0509), Wellington, is a scientific organisation of 110 members involved in conservation of energy and efficiency in fossil fuel utilisation, along with concerns on the reduction of air pollution emissions.

The *Tasmanian Wilderness Society* (0023), Australia, is a campaign citizen action group, promoting energy conservation and the use of alternative soft technologies, such as solar power.

The *New Zealand Clean Air Society* (0297), Christchurch, is concerned with the efficient and economical use of energy and of all fuels, in order to prevent wastage of national resources and to guide clean fuels to areas suffering from domestic or industrial pollution.

Bureau Veritas (0124), Levallois-Perret, France, is an international organisation having centres of inspection in 140 countries working on monitoring and protecting the environment. Among other matters they are concerned with investigating the optimal use of energy and energy-saving measures in the industrial, domestic and tertiary sectors.

Ecoplan Institute (0347), Geneva, Switzerland, is a foundation for a planned environment, concerned with several environmental issues. Among their interests is energy economy through the development of new techniques.

The *Centre for Alternative Industrial and Technological Systems (CAITS)* (0379), Dagenham, U.K., states that they place a premium on products which fulfill socially useful criteria, rather than those which merely meet market "needs". Among its projects related to energy is one on energy conservation in local practical settings concerning heat insulation, based on co-operative development. Another project is the development of a "hybrid power pack" of internal combustion, an electric power unit which reduces fuel consumption by 50% and toxic emissions by 80%.

Sydney University, Eco-Tech Workshop (0021), Australia, is involved in energy conservation and environmental responsibility in housing. Demonstration of an autonomous-house project is being carried out, integrating solar, biogas and wind power generation.

The *Royal Architectural Institute* (0084), Ottawa, Canada, is involved in energy conservation design in architecture. Similar activities are performed by *Amity Foundation* (0429), Eugene, U.S.A.

The *International Council for Building Research, Studies and Documentation* (0288), Rotterdam, Netherlands, is concerned with energy conservation in the built environment and with the use

of alternate sources of energy.

The *Centre for Interdisciplinary Research on Development (0038)*, Brussels, Belgium, is concerned with information in the field of energy conservation, and thermal insulation.

The *Institute of Fuel (0296)*, New Zealand Section, Stokes Valley, is involved in education and technical assessment in the fields of natural energy resources, renewable and non-renewable, for its optimum application to national energy needs. They organise courses and seminars to encourage industrial energy conservation (Co-Generation Symposium 1979) as well as comments on Government energy policy documents and cooperating with the Standards Association in compiling energy conservation standards.

The *Bicycle Institute of Victoria (0006)*, Melbourne, Australia, lobby both State and Federal Governments for the use of bicycles as an energy conservation measure.

The *International Road Transport Union (0354)*, Geneva, Switzerland, is involved in energy-saving research. They have several publications on energy and public transport: *The Energy Crisis* and *The Energy Consumption in goods transport by route-comparisons with rail transport*, improvements in energetic efficiency in lorry transportation.

C. Decrease in energy consumption

Most NGOs promote a life-style based on a self-sufficient energy supply and on a decrease in the energy consumption. This purpose is sometimes encouraged in new communities. Other NGOs promote changes in the patterns of food consumption, housing, transport, etc.

Energy Probe (0510), Ottawa, Canada, provides policy direction for the Canadian government on energy issues, encouraging the adoption of long-term energy policies and keeping the public informed about energy matters and uses. Among their concerns, they prepared a paper for the 1978 Couchiching Conference - "Growth in a Conserving Society" - sponsored by the Canadian Institute on Public Affairs, Lake Couchiching, Ontario, August 1978.

The *Citizen Association to Save the Environment (CASE) (0070)*, Victoria, B.C., Canada, is a local, regional and national citizen action group of 175 members. The Association is concerned with the possible irreversible damage to the environment by the misuse of technology, including energy technology. It supports a reduction in consumerism and those practices which create wasteful and harmful consequences. CASE has developed a 50 sq.ft. parabolic solar collector providing 400°F and complete with electronically-controlled sun-tracking and 1 KW windmill generating system with electronic controls, wind sensing and velocity measurement, and electronic sensing/switching systems. CASE displays models of solar space- and water-heating for residential use; and provides information on municipal waste retrieval and a sewerage composting plant; high density heat solar collector systems; methane gas generation and windmill power generating systems. The philosophy of the organisation can be appreciated in one of their statements: "North American Agricultural systems are most efficient if we view the quantitative output per farmer or man-hour. If, however, we consider the energy input/output equation, the energy input is about five times the food/energy output."

Save Tomorrow - Oppose Pollution (STOP) (0086), Alberta, Canada, is a citizen action group having more than 5,500 members. It promotes the idea of conservation as a way of life. The organisation

is involved in developing, lobbying for and acting on a tough Canadian Energy Policy through action programmes. Their philosophy is that "Unchecked growth must end sometime. The Earth's finite resources have been squandered as if the storehouse were inexhaustible... The direction to be taken is the obvious one: better management of the extraction and use of our resources. The sooner we do away with our addiction to consumption and growth for the sake of growth, the better."

The *Community Planning Association of Canada (0511)* Ottawa, is a national organisation with regional offices, concerned with the promotion of public participation in the planning process. They emphasize energy-conserving life-styles and the consideration of alternative energy sources.

The *Consumers Association of Canada (0516)*, Ottawa, is a voluntary non-profit organisation of some 100,000 members across Canada. It is dedicated to representing the consumer interest at all times, and has a network of local consumer groups situated throughout the country. They treat energy issues in a "Conserver Society" perspective, and have participated in a workshop "The Conserver Society: The Technological Challenge". Renewable energy aspects were discussed on the basis of the following papers: "Canadian Renewable Energy Prospects"; "Renewable Energy Sources: Operational Examples"; "Institutional Factors"; "Energy Conservation: Means and End". In their bi-monthly magazine "Canadian Consumer", they advise the consumer on home energy saving measures, food standards, health risks due to consumption, modern "convenience" foods, etc.

Nature and Environment Protection (0122), Helsinki, Finland, is involved in the promotion of a total view of Finland's Energy Policy, including an evaluation of different energy sources and their environmental impacts. "Since Scandinavian countries belong to the world's top energy consumers, it is necessary to plan for a stop to growth." The organisation participates in a Nordic Energy Week, with meetings, exhibitions, demonstrations, fund-raising campaigns, and so on.

Aktie Strohalm (0297), Utrecht, Holland, is involved in making the public conscious of the destruction of the environment "by the social system in our kind of countries". Changes in individual consumption patterns and in the growth phylotrophy are recommended. They state: "The Netherlands is the most populated country in the world. But as production growth is six times as fast as population growth, the problems lie not with the number of people, but with what is produced and how. Our economic system is the cause of this. Companies are constantly encouraged to expand. In order to be able to compete, this is done as cheaply as possible, and consequently in a reckless and polluting manner. More and more unnecessary goods, faster and faster deterioration, obsolescence, and replacement. The decision about what, where and how things are produced lies with those who have the money (big business, banks, etc.)". The organisation plays an important role in the postponing of further nuclear power plants in the Netherlands.

D. Environmental Protection and Conservation

Some NGOs involved in nature protection and wildlife management are concerned with the energy issue, as far as it is related to the conservation of an ecological balance.

The *Wildlife Management Institute (0495)*, Washington D.C., U.S.A., are concerned that intensive energy

developments have the potential to degrade or destroy habitat. They provide information to federal and state agencies, trade associations and citizen groups, in order to promote the adoption of appropriate guidelines for energy development.

The *Conservation Council of Ontario* (0072), Canada, is part of an international network on conservation of nature and natural resources, which monitors the state of the planet's living resources, mobilises scientific resources to investigate the serious problems and recommends the most effective solutions. The organisation is concerned with the consequences of energy conversion in the form of pollution.

The *Meteorology Department, University of Stockholm* (0338), Sweden, carried out research in the field of environmental effects of energy production: effects of CO₂ on climate, including oceans, of acidification by SO₂ and on nitrogen compounds in the atmosphere.

The *Institute of Terrestrial Ecology* (0394), Cumbria, U.K., carries out research to provide a sound scientific basis for predicting and modelling future environmental trends, especially those resulting from man's activities. Among their projects related to energy, there are:-

- Some aspects of radionuclide contamination of terrestrial habitats. The aims are the provision of ecological and advisory information, and the assessment of information available on the distribution, of cycling and measurement of selected nuclides in terrestrial habitats.
- Alternative energy sources - the ecological consequences is a project aiming to develop an ecological model for alternative energy sources through the construction of scenarios and maps of the ecological consequences in ten to twelve regions of Britain.
- A project on forest management for energy, bringing together existing knowledge on the socio-economic consequences and constraints on the use of forests for direct energy production, including a comparison of alternative land uses and the energy balance of trees as compared with other crops.
- Another project is a comprehensive study into the use of carbon as a renewable resource.
- Finally, a study on the potential for fuel cropping in upland Wales, which is to carry out an assessment of the compatibility of various kinds of afforestation schemes with existing land use, including the effects of forests on adjacent pastures and on soil structure and fertility.

The *West Coast Environmental Law Association* (0088), Vancouver, Canada, produced a five-volume analysis and compilation of comparative legislation regarding oil tanker navigation and safety, regulation of oil parts and the law concerning oil spills. The organisation also advised and participated in a West Coast Oil Ports enquiry, conducted public legal seminars on uranium mining and a public inquiry to consider a project to build a dam generating hydro-electric power. Generally, the organisation serves specific legal requirements for environmental impact assessments prior to resources development.

IPIECA (0398), London, U.K. is an oil-company international study group for conservation of clean air and water, and is concerned among other matters, with impacts due to oil transportation. Some of their publications on the subject are: Ship to Ship Transfer Guide; Prevention of Oil Spillages through cargo pump-room valves; Clean Seas Guide for Oil Tanks; International Safety Guide for Oil Tankers and Terminals; Monitoring or Retained Oil Residues, etc.

Concawe (0289) The Hague, Netherlands, has similar concerns to that of the London Section, studying the optimum degree of environmental control on fuel uses (Testing and Inspection methods in the manufacture of pipelines; water, groundwater and soil pollution, etc.)

Sierra Club International (0485), New York, is working on problems associated with the marine transportation of oil and with off-shore oil drilling and the heavy oil pollution this brings. Also participating in the Law of the Seas Conference regarding prevention of oil spills, among other things.

The *Cousteau Society* (0442), New York, is similarly working on the prevention of oil pollution caused by the transportation of this energy to consuming nations from producer nations by sea.

Coalition Against Oil Pollution (0440), Seattle, USA, is a unique effort by 26 NGOs in one region of the U.S. to assess the location of an oil port proposed for Seattle for Alaskan oil to the continental U.S. The NGOs ranged from outright environmental groups to business and tourist associations; from churches to native organisation. They represent more than 75,000 members, and worked from 1968 to the present to prevent the destruction of the marine resources of their coast by the proposed port.

Natural Resources Defense Council (0475), Washington, D.C., U.S.A., assisted the efforts of many NGOs on the international scene to prevent the location of a supertanker oil port on the island of Palau in the South Pacific.

E. Nuclear Power Considerations

The *Battelle Memorial Institute* (0433), Columbus, U.S.A., working in the field of environmental technology, deal with, among other things, power and energy problems. The Laboratories are involved in a wide variety of activities related to the energy field. Current studies for various electric power producers and government are concerned with comprehensive environmental assessment of power plant siting, in which one or more of the following factors are examined: meteorology and climatology; hydrology; aquatic and terrestrial ecology; population and land and water use; radiation surveillance and dose estimation; and public acceptance. In addition, cost-benefit analysis is being made to determine the environmental impacts of nuclear power generation and to assess the benefits derived from the utilisation of this power. Other related programmes include:

- Assessment of the environmental effects of the manufacture of synthetic natural gas and other by-products from coal.
- Acquisition of field data on specific gaseous effluents (ozone, total oxidants, nitric oxide, and nitrogen dioxide).
- A thirty-year projection of the environmental effects resulting from nuclear power plants being placed in a major river basin, with special attention to tracing the pathway of potentially harmful radionuclides through air, water and food media.

There are a number of projects aimed at developing high- and low-temperature fuel cells and a high-current-density, high-power-output battery system. There are also several gasification (pyrolysis incineration) research projects aimed at recovering the energy in solid wastes in the form of a low-BTU gas.

Strong public awareness of nuclear power topics is one of the newest and most unexpected phenomena of the last decade. The emergence of this phenomena is closely related to the active participation of NGOs in the nuclear controversy. Information has been provided mainly through organisations in developed countries, both on future nuclear projects in specific regions and general technical matters related to nuclear power generation, stimulating the involvement of the public in the nuclear debate. Citizen action groups and networks of them throughout the world have been influenced in political and legislative spheres, mainly in their concern for the adverse effects of the use of nuclear power. Some examples of these kinds of activities are given below.

Concerned Citizens of Tennessee (0441), Dixon Springs, U.S.A., has taken legal action against the Tennessee

Valley Authority over the 5,000 megawatt Harstville nuclear power plant.

Ecology Center of Southern California(0448), U.S.A., is actively involved in opposing the San Joaquin nuclear power plant.

Environmental Coalition on Nuclear Power(0449), Jenkintown, U.S.A., is oriented towards securing a complete moratorium on the construction and operation of nuclear fission power plants. At the same time, the organisation promotes reliance on energy conservation and on the development of non-polluting long-term energy sources.

The Environmental Coordination Organisation(0450), Dubuque, U.S.A., is involved in the improvement of environmental quality and the promotion of ecologically sound decisions. Among their priorities is raising public awareness on nuclear energy issues.

Lorien House(0467), Black Mountain, U.S.A., actively opposes the nuclear power industry. The organisation provides information on solar energy and alternative technologies: "Creating Energy"; "Using the Sun"; "Practical Sun Power"; and "The Solar Energy Notebook" are amongst their books and publications.

The People's Energy Project(0481), Lawrence, U.S.A., intervened in regulatory hearings on a nuclear power plant installation. They provide regular demonstrations and presentations on nuclear power matters.

Public Interest Research Group(0483), Michigan, U.S.A., promotes energy conservation and intermediate technology, discouraging nuclear facilities. They are involved in energy policy projects, including legislation on nuclear power and considerations on nuclear safeguards.

The League Against Nuclear Danger(0466), Wisconsin, U.S.A., is involved in informing and educating citizens regarding nuclear power plant proliferation and alternative energy sources. Among nuclear matters, they are concerned with: standards for permissible levels of exposure to ionizing radiation; studies of the public health implications of the nuclear industry; setting up a national human surveillance system; emergency evacuation planning; nuclear hazards, etc.

The Canadian Scientific Pollution and Environmental Control Society(0067), Vancouver, Canada, is engaged in the preservation of the quality of the environment; among their concerns is the proliferation of nuclear power in Canada. The group produced a book jointly with the Canadian Voice of Women entitled "Nuclear Power: Danger Radiation".

The Society to Overcome Pollution(STOP)(0519), Quebec, Canada, is concerned mainly with the pollution aspects of energy - preserving and improving the quality of the physical and human environment. They submitted an Energy Policy Brief to the province of Quebec. The institution was also concerned with the distribution to the Montreal and Quebec public of literature on nuclear and conservation issues.

CANDU(0068), Ontario, Canada, is involved in providing literature, research and public information regarding all aspects of nuclear electric generation, emphasising political and social ramifications. Among the achievements of the organisation is to have influenced The Royal Commission on Electric Power Planning in their recommendations to the Government of Ontario and to have increased energy-use awareness. They published the books "Half Life: Nuclear Power in the Future Society", by Ralph Torrie; "Overview on Energy Use in Society"; "Technical Discussion on Nuclear Safety Problems".

The Saskatoon Environmental Society(0085), Canada, participated in a number of enquiries into electric power generation and uranium development. The organisation has undertaken a major campaign aimed at public education on general energy issues.

The Canadian Coalition for Nuclear Responsibility(0514), headquartered in Montreal, is a nationwide coalition of Canada's major NGOs. Its members include church organisations, women's groups, like the Voice of Women, and distinguished politicians. It was formed to lobby the Canadian government into holding a nation-wide public hearing on the impact of developing nuclear energy in Canada, and the impact of exporting the CANDU reactor. Among its activities it has undertaken monitoring the effects of small quantities of ionizing radiation at nuclear plant sites.

Nuclear Information Network(0407), London, U.K., provides information and a liaison network for organisations with a concern for nuclear energy, weapons, and alternative energy.

Student Community Action Resources Programme(0419), London, U.K., provides local student volunteer groups in some areas of activity. Among them they support SANE - Students Against Nuclear Energy.

Friends of the Earth(0387), London, U.K., has been involved in the development of a non-nuclear energy policy since 1972, using all available means to reach the general public and political spheres, in the national, international and local debate.

The Council for the Protection of Rural England(0382), London, U.K., is concerned with the nuclear energy policy for the U.K. and the Common Market. They are also interested in the impact of coal production on the environment.

The Irish Conservation Society(0232), Dublin, Ireland, is a citizen action group influencing legislative decisions and organising meetings, conferences and seminars and promoting awareness of those factors which cause a deterioration in the quality of life. They are deeply involved in the opposition to nuclear power proliferation in Ireland, defining themselves as one of the earliest anti-nuclear organisations in Ireland. Many lectures, media interviews and five books have been their achievements in the year 1978. The Society also cooperates with evidence on the Windscale Enquiry.

The Environmental Council of Northern Territory(0013), Darwin, Australia, actively opposed proposals to mine uranium in the Northern Territory. They hosted an important conference on the subject in 1975. The organisation also undertook a major project on "Low Energy Technology", beginning in 1974. The project includes a journal "Solar-wise" and a separate but related land settlement scheme "The Darwin Solar Village".

The Natural History Society of South Australia(0019), Athelstone, supports the movement against uranium mining and the use of atomic power, all efforts to develop alternative energy sources and greater control of fossil fuel resources "which the western world is using wastefully".

The Campaign Against Nuclear Power(0009), Queensland, Australia, is specially concerned with the destruction of aboriginal lands and settlements by uranium mining activities. By means of general campaigns, information through the media and newsletters, distribution of information to uranium workers, rallies, etc., they actively opposed nuclear energy developments, alleging that there would be environmental impacts, risks to health, safety and civil liberties. They were also in disagreement with uranium export overseas. The citizen action group has participated in a uranium moratorium declaration and displays on alternative energy technology.

The New Zealand Ecological Society(0298), Christ-

church, submitted a document to the New Zealand government entitled "Nuclear Power Generation in New Zealand", which was published in the "New Zealand Journal of Ecology".

The *Australian Conservation Foundation* (0003), Victoria, has as one of its priority areas of interest, energy resources. Particular current issues concern uranium mining, energy conservation and uranium export to developing countries. A typical area of involvement was the opposition to a proposed 1000 MW gas-fired power station, planned to be built within the Melbourne urban area.

The *Campaign Against Nuclear Energy* (0008), Adelaide, South Australia, is involved in the promotion of a non-nuclear future. They are concerned with the effects of uranium mining on Aboriginal Australians, and on the environment. Impacts of others parts of the nuclear fuel cycle are also a matter of interest to the citizen action group, as well as alternative energy sources and the potential for energy conservation.

The *Tasmanian Environment Centre* (0023), Hobart, is a resource centre, providing a focus for some 40 local environmental groups. Some of these groups are opposed to nuclear power and to unnecessary high-energy producing hydro-electric developments on Tasmania's last wild rivers.

Ecology and Survival (0128), Muchouse, France, is a scientific organisation, having 600 active members, which studies the ecological alternatives in all areas and defending an ecological position at the political level. It participated in the co-ordination of an anti-nuclear campaign, held in The Hague 1978.

Nord Nature Federation (0508), France, is a large national organisation - 20,000 active members - concerned with the protection of nature. They participate in anti-nuclear activities and provide information on nuclear energy through films and conferences, being also interested in research on alternative sources of energy.

The *Anti-nuclear Committee of Cataluna* (Barcelona), (0331), Barcelona, Spain, maintains regular relationships with other anti-nuclear groups in Spain and Europe. They have edited three booklets on the problems caused by nuclear reactors.

The *Natural and Urban Environment* (0237), Genoa, Italy, publish one of the few environmental magazines in Italy, "L'Ambiente". Among the several articles on energy issues, they are specially concerned with nuclear power generation and are critical of the Italian energy policy, which is based on nuclear development.

The *Conservation Trust* (0381), Reading, U.K., produced a set of slides on Nuclear Power entitled "Issues and Dilemmas", supplemented by very detailed background notes.

The *International Council of Scientific Unions* (ICSU), (0138), Paris, France, is involved in the encouragement of international scientific activity for the benefit of mankind. It does this by initiating, designing and coordinating international scientific research projects. Among diverse scientific matters, they are involved, by special request of the President of the National Academy of Sciences (Washington), in the problem of nuclear waste management. The four areas given as the focus for their study are: generation of waste (fuel processing); packaging of waste or immobilisation; transportation and disposal of waste. In all four of these, considerations of the security of plutonium from terrorists is an important factor when considering safety, especially as far as fuel-processing is concerned.

ICSU is also carrying out interdisciplinary research on the disposal of nuclear waste, related to seven specific problems which are as follows:

- Terrestrial disposal: deeply buried in salt, igneous rocks, clays and shales, etc., and disposal on or near the surface.

- Marine disposal: in and on the seabed, subduction.

- Disposal in the Antarctic ice sheet.

- Extra-terrestrial disposal by rocket.

- Pathway analyses: an essential component in considering any type of disposal.

- Alternatives: other energy sources might reduce the amount or modify the type of nuclear wastes.

- Perceptions of problems: physical and perceived problems: problems as seen by technologists are often different from the same problems as seen by other professionals.

F. Job Generation through Energy Policies

The *Australian Conservation Foundation* (0003), Victoria, Australia, sponsored the formation of the organisation "Environmentalists for Full Employment" (same address) which is a coalition of environmental groups, unions and other organisations. One of its purposes is to bring to people's attention the fact that major energy projects like dams and nuclear power plants employ fewer people per unit of money spent, than do energy conservation and alternative energy programmes. They point out that efforts to reduce major environmentally harmful energy projects in favour of conservation and development of new sources of energy would produce more, not less, employment. They also feel that "capital currently earmarked for environmentally harmful or resource wasteful projects such as uranium mining or increasing electricity generating capacity could provide much more social benefit, and many more jobs, if invested in alternative environmentally sound activities. For example, the capital required for plant at the proposed Ranger uranium mine in the Northern Territory could provide 25 times more jobs if invested instead in a manufacturing industry such as solar-collector production". EFFE aims to demonstrate that the path towards environmental harmony can also lead towards full employment.

Environmentalists for Full Employment (0453), Washington, U.S.A., produce a Guide to Jobs and Energy, providing a documented analysis on the relationship between energy and economy, arguing that while national energy use has been increasing all the time, so has unemployment. The organisation feels that the best approach to energy sufficiency, economic prosperity and jobs is that which combines increasing energy efficiencies with a variety of diverse and safe energy-supplying technologies. It finds that to the energy industry, "growth" always meant growth in energy production in order to satisfy its own needs, no matter the consequences for the rest of society. But it feels "growth" means rather a national policy of full employment, improved standard of living, improved job safety and public health, expanded opportunities for leisure activities and the development of rewarding relationships with other people.

G. General Energy Considerations

i) Energy Policy

The proliferation of activities oriented to

influence general energy policies or policies related to the development or utilisation of specific sources of energy, is widespread throughout the NGO movement.

Alberta Wilderness Association (0063), of Canada, focuses concern on the harmful environmental effects of coal strip-mining in the Canadian Rocky Mountains.

The Royal Town Planning Institute (0413), London, U.K., is a member of the British Watt Committee for Energy. It is at present contributing to a working party examining the long-term implications of energy requirements on land use.

The Swiss League for the Protection of Nature (0361), Basle, Switzerland, contributes to the discussion on Swiss global energy policies.

The Finnish Youth Nature Federation (0121), Helsinki, Finland, took part in the Nordic Energy Action (1979) and is involved in energy action programmes. The organisation acts as a link between the young field biologist and environmentalists, fighting against destruction of nature.

ii) Dissemination of technical information

The Centre for International Environmental Information (0438), New York, U.S.A., is oriented to foster an understanding of international environmental problems, especially as they affect North America. The Center is currently in the process of publishing a "Directory of Environmental Energy Specialists" for the news media. The Directory will include 1,600 individuals who are among the top U.S. experts in a broad range of energy-environment fields, including solar, nuclear, geothermal, conservation, coal, petroleum and ocean current conversion. The experts are drawn from industry, government, environmental organisations and the scientific and academic communities. The Centre also produces the World Environment Report.

The National Wildlife Federation (0473), Washington, U.S.A., have as a series "Conservation Education Publications", which include a bibliography of energy, oriented to show the available resource material useful to developing energy education/conservation programmes.

The International Youth Federation for Environmental Studies and Conservation (0107), Skanderborg, Denmark, has produced educational material concerning energy policies, nuclear power, oil, coal, solar, wind, biogas energy, and firewood, stressing the environmental and social benefits of different kinds of energy sources, and of energy conservation. IYF local groups, in other parts of the world, have brought these issues to the public through practical demonstrations of technologies, supplying information and lobbying authorities. Some groups have participated in producing alternative energy scenarios for their countries. The organisation consists of more than 70,000 members spread throughout the world.

2.2 EXAMPLES OF NGO ACTIVITIES IN LOW

ENERGY CONSUMING COUNTRIES

A. Harnessing renewable resources of energy

2.21 Asia

The Science Education Centre (0217), Atarra, India, is involved in the production of methane gas from cow-dung and other vegetable wastes for domestic purposes.

Urban Designers Associates (0324), Quezon City,

Philippines, collaborated with the energy development board in designing their solar laboratories in Port Bonifacio. They also carry out research on passive cooling and on a prototype development of bio-gas generators for marginal housing.

The Faculty of Architecture (0372), Bangkok, Thailand, undertakes research on the use of solar energy for domestic needs.

Lanka Jatika Sarvodaya Shramadana Sangamaya (0333), Moratuwa, Sri Lanka, has a composite project for the use of bio-gas, solar energy and wind power, in collaboration with the Eindhoven University and Tools, in the Netherlands.

Agricultural Tools and Research Centre (0174), Bardoli, India, is involved in the utilisation of solar energy for creation of the optimum environment for animal and plant production and for natural heating and cooling of buildings in Northern India. They design and develop solar energy collector units for production of high pressure steam and vapour for application as an alternative energy source. A large number of solar gadgets have been designed, fabricated and tested.

Gram Seva Samiti Taronda Nitaya (0194), Madhya Pradesh, India, developed Gobar-gas plants.

Khadi and Village Industries Commission (0207), Bombay, India, installed small gobar-gas plants in villages for anaerobic digestion of waste material. They achieved a 60% efficiency in cooking burners, gas lamps, and engines for gobar-gas. The organisation has also undertaken a project on heating gobar-gas plant digestors by solar energy.

Millions of Trees Clubs (0212), Tumkur, India, are concerned with firewood scarcity shown by them as the biggest threat in rural India. They are concentrating on mass tree-planting to make villages self-sufficient in firewood.

The Structural Engineering Research Centre (0221), Madras, India, has put special emphasis on the development of techniques that are less energy intensive. An economical method of producing bricks from lateritic soil using an energy-saving production process has been developed by the Centre. Research and development work on the utilisation of solar energy is proposed to be taken up in collaboration with a few other research and academic institutions. Analytical and experimental studies on reactor containment vessels used in nuclear power plants have already been taken up by the Centre, and at the request of the Department of Atomic Energy, a model of the containment vessel proposed for the Madras Atomic Power Plant was tested to verify the design assumptions and ascertain its reserve strength. It is also proposed to take up research and development work in the field of power plant structures in order to optimise the designs for achieving economy in the use of materials and in construction costs.

The Appropriate Technology Development Association (0176), Lucknow, India, is concerned with projects aiming to provide villages with alternative fuels, like solar energy and bio-gas. They have carried out research on solar heaters and cookers.

Banwasi Seva Ashram (0177), Govindpur, India, is engaged in programmes oriented to improving the standard of living of 2000 families in the area. Among their projects is the conversion of organic waste into compost and methane gas.

The Department of Mechanical Engineering (0189), Ludhiana, India, is involved in the design and development of solar energy collector units for the production of high pressure steam and vapour

for its application as an alternative energy source. They have utilised solar energy for heating and cooling of buildings in the north of India.

Highlanders New Life Society (0195), Tehri, India, is involved in the protection of the Himalayan region. A small community village was established in the hills, run on solar energy, methane gas and small hydropower units.

Agriculture Development Agencies (0034), Dacca, Bangladesh, is an organisation serving as an information centre and a coordinating body for seminars and workshop on agricultural subjects. They publish experiments on solar and wind energy appropriate to Bangladesh and collect library materials on these subjects.

Development and Consulting Services (0278), Butwal, Nepal, carry out research and development into using small to medium scale turbines for hydro-electric plants and generators suitable to help people in small towns and villages in the hills of Nepal. They are also involved in research and new designs of bio-gas plants, for cheaper and better efficiency in low temperatures.

2.22 Africa

The Housing Research and Development Unit (0248), Nairobi, Kenya, is doing research on the utilisation of solar and wind energy and on the design of autonomous houses.

The Kenya National Farmers Union (0251), Nakuru, Kenya, promotes the sound use of the soil, the use of methane gas and sludge in small-scale farming.

National Council of Women of Kenya (0253), Nairobi, has launched a programme to plant several million trees throughout the country to replenish firewood supplies and to provide raw materials for other purposes including food, forage, and building materials. The programme is being carried out in cooperation with the Government.

National Christian Council of Kenya (0252), Nairobi, has incorporated in its adult literacy programmes education about the need to replant and cultivate trees.

Tunnel Company (0254), Fort Tenant, Kenya, is engaged in the design and manufacture of Hutchinson solar units in varying sizes and capacities and in producing and selling methane plants for converting farm and plantation waste into fertilizer.

The Projects Development Institute (0305), Enugu, Nigeria, is carrying out research and development work on Enugu coal, with particular reference to obtaining a smokeless solid fuel for domestic use, as well as chemical by-products. They are also involved in the development of cheap solar heaters, manufactured locally, and solar driers for agricultural produce.

The Inter-State Organisation for Advanced Technicians of Hydraulics and Rural Equipment (0499), Ouagadougou, Upper Volta, are involved in the development of solar pumps.

The Biology Department, University of Zambia (0505) Lusaka, is interested in the problem of deforestation caused by excessive charcoal burning around urban areas and in carrying out a survey on charcoal use and possible alternatives of low-income sources. Elsewhere in the University, experiments are being done on biogas production. The University was represented in the Energy Conference organised by the Swedish Academy of Sciences in 1975.

Pelegano Villages Industries (0054), Gaborone, Botswana, are looking into alternative energy

systems; they designed windmill solar water heaters for use in the villages without piped water.

2.23 Latin America

The Association of Agronomists of the State of Sao Paulo (0056), Brazil, stimulates studies and discussions on non-traditional sources of energy, basically for agriculture, mainly the conversion of solar energy through plants, wind energy, sea and river energy. The aims are to substitute the present dependence on fossil fuels and to protect man against the dangers of nuclear energy.

The National Association of Manufacturers (0098), Medellin, Colombia, is interested in research and dissemination of information on technologies oriented to the use of alternative sources of energy, both for industry and domestic use in rural areas.

The Environmental Education Programme (PEA) State University (0100), San Jose, Costa Rica, together with other national institutions, organised the First National Seminar on Energy, analysing the traditional forms of energy supply in the country, and looking for alternatives in the future: wind, geothermal, wave, biomass and solar energy resources.

The Environment Foundation (0276), Mexico DF, Mexico, in the field of energy, are engaged in some experimental projects on the use of wind and solar energy - solar cells, wind generation - and on the production of bio gas, using organic waste materials transformed by a digester of diverse construction, according to the situation.

The Industrial Corporation for the Regional Development of Bio-Bio (0090), Chile, is involved in research and development of micro-hydroelectric plants and bio-gas production.

The Industrial Information Centre (0168), Tegucigalpa, Honduras, are interested in research and promotion of low-cost equipment that utilise renewable resources of energy, mainly solar, wind and hydroelectric.

Mesoamerican Centre for Appropriate Technology (0167), Guatemala, Guatemala, is engaged in experimentation and research on bio-gas and solar energy use in human settlements.

The Argentine Institute for Research on Arid Lands (0002), Mendoza, Argentina, is involved in research on the use of solar energy for houses in dry areas.

The Association for Scientific Research of the Plateau (0164), Quetzaltenango, Guatemala, have been carrying out research on alternative sources of energy: solar, wind and methane gas. They have achieved experiments on showers, driers and a model of a methane digester for low-temperature regions.

Ecodevelopment Center (0275), Mexico DF, Mexico, are carrying out experiments in three pilot villages on the use of integrated energetic systems: bio-gas, wind and solar energy and microturbines.

The Association for Sao Carlos Environment Protection (APASC) (0057), Brazil, was created to face the problems caused by an accelerated urban growth: deforestation, disappearance of some animal species; industrial development and population growth which threatened the quality of life. A debate paper on Energy, Environment and Society, published by the organisation, advocates the use of soft energy technologies which recommends decentral-

ised energy development. Decentralisation would allow a greater thermodynamic efficiency in the use of energy, by avoiding losses due to energy transmission; by matching energy production to the scale of final use. Decentralisation would also avoid heavy investment of capital.

B. General environmental concerns

Natural Resources Development Cooperative Society (0214), Hyderabad, India, carry out comprehensive ground-water surveys for several organisations, including a nuclear fuel complex.

The *Bermuda Biological Station for Research (0049)*, St. George, has been investigating oil pollution in the sea since 1970. Special emphasis has been placed on the distribution, effects and fate of pelagic petroleum residues or "tar lumps".

The *Columbian Society of Ecology (0093)*, Bogota, is concerned with the investigation of the possible environmental impacts due to coal exportation through the seaport of Santa Maria. They are also interested in the impact produced by the sinking of the oil tanker St. Peter near Tumalo, Columbia.

The *Uruguayan Institute for the Preservation of the Human Environment (0501)*, Montevideo, promoted a draft law on the control of oil discharges along the coast.

The *Asian Environmental Council (0370)*, Bangkok, Thailand, is involved in creating awareness of environmental problems in Asia. Among their activities, they have worked to stop a nuclear power plant project.

The *Mauritius National Youth Committee (0272)*, Phoenix, promotes the rational use of energy among young people and students.

The *Environmental Protection Society (0265)*, Petaling Jaya, Malaysia, organised a seminar on Energy and the Environment; also attempting to prevent pollution from oil spills on their coast caused by heavy tanker traffic nearby.

The *Ecological Society of Thailand (0373)*, Bangkok, Thailand, in cooperation with the Faculty of Environment and Resource Studies, organised a seminar on "Energy Economy and the Environment", which was held in Bangkok during the period 13-15 December, 1978.



1.1 GENERAL STATEMENT

The four main natural hazards responsible for the bulk of damage to man and the environment are: drought, tropical cyclones, floods and earthquakes. There are some NGOs concerned with each of these natural hazards.

NGO activities are oriented to measures for mitigation of natural disasters, and disaster relief. Under measures to mitigate disasters, the NGO activities fall into the following categories:

- . Forecasting measures
- . Post-disaster measures
- . Education

Some natural disaster causing phenomena have beneficial effects such as the formation of highly fertile soils from volcanic activity; however, no interest was expressed in the beneficial effects by the NGOs surveyed.

1.21 General Trends in NGO Activities Globally

NGO activity fell under the headings which are listed below. Not included are NGOs which are concerned with mitigating disaster by such long term measures as tree-planting against floods, well-digging against droughts, etc., because these NGOs are mentioned under the chapter on 'The Use of Natural Resources'.

The main kinds of NGO activities are:

A. Measures for Mitigation of Natural Disasters

(i) Forecasting

In this field, NGOs are involved in research, oriented towards forecasting of natural disasters so that steps can be taken to mitigate the effects of the phenomena. Warning systems, in which NGOs are involved in researching, include surveillance and prediction of volcanic eruptions, earth tremors, floods avalanches, and climatic changes; production of volcanic hazard maps; evaluation of volcanic risks; and earthquake engineering.

When there has been some forecasting of a possible natural disaster, it is possible to plan in the short term for emergency preparedness, or in the long term to plan land-use so that human activities are less likely to be at risk. There are NGOs whose emergency preparedness involves having specially trained groups of people to handle disaster needs and/or who have provided stores of such supplies as food and medicine in places easy to reach after a disaster. Long term measures are taken by NGOs involved in regional and urban planning in disaster-prone areas, building and design construction and civil engineering. For example, some NGOs are concerned especially with building design and construction for areas affected by such hazards as tropical cyclones and earthquakes.

(iii) Post-disaster measures

NGOs which work to reconstruct areas devastated by natural disasters, such as earthquakes, tropical cyclones, floods, volcanic eruptions, snow, winds

and land-slides fall under this heading. Reconstruction of buildings is usually one of the main activities but it also involves road-building, repairing damage to potable water systems, re-establishment of communications, etc. NGOs mainly involved with these activities were usually national or local organisations which helped carry out some of the reconstruction.

(iii) Education

Courses and/or educational material on natural disasters are usually intended to provide the learner with knowledge and skills relevant to lessening the likelihood of disaster and to help people cope with the disaster when it has occurred. Disaster from floods was of particular interest to NGOs because it can often be directly related to deforestation and therefore there are ways possible to overcome this.

B. Disaster relief

International NGOs are the main organizations offering this kind of assistance in the case of any kind of natural disaster. It can consist of the provision of food, clothing, funds, shelter, child care or location of missing persons. Relief organisations are often followed up by some support for more long-term reconstruction activities. Most of this relief is offered through government and non-government organisations already working at the place of the disaster.

There are also community organisations which offer assistance in the case of disasters in their locality, but they are not mentioned here because they deal with disasters only in particular instances as they arise, rather than having on-going activities in preparation for disasters. They may also have an entirely different function under normal conditions, such as raising funds for a local church, but adapt themselves to serve the wider community needs when a disaster occurs.

C. Consultancy Services

This refers to the provision by some NGOs of expertise to other organizations working to relieve the effects of a natural disaster.

2.1 EXAMPLES OF NGO ACTIVITIES

A. Measures for Mitigation of Natural Disasters

International

(i) Forecasting and (ii) Post-disaster measures

The *International Electrotechnical Commission* (0353), Geneva, Switzerland, assists in the re-establishment of essential services after a natural disaster and devises means for protection against lightning.

The *International Association of Volcanology and*

Chemistry of the Earth's Interior (0396), Nottingham, England, is concerned with the surveillance and prediction of volcanic eruptions, production of volcanic hazard maps and evaluation of volcanic risks. They publish periodicals on volcanology and volcanic eruptions, a newsletter, a catalogue of active volcanoes of the world and data sheets on the post-miocene volcanoes of the world with index maps. Seventy countries are members.

The *International Union of Geodesy and Geophysics* (0047), Brussels, Belgium, forecasts earth tremors, floods, avalanches and climate changes, and surveys volcanoes.

The *International Council For Building Research Studies and Documentation* (0286), Rotterdam, Netherlands, has 200 members who carry out research in such fields as housing sociology, industrial buildings, acoustics and earthquake engineering.

The *International Union of Geological Sciences* (0276), Ottawa, Canada, acts to facilitate and sponsor study of problems in the geological sciences; this includes studies related to prediction of earthquakes and volcanic eruptions. They disseminate information through a quarterly periodical and other documents.

Developed Countries

The *Earthquake Engineering Research Institute* (0445), Berkeley, USA, investigates and reports on destructive earthquakes, holds scientific conferences and symposia, publishes earthquake engineering reports, and advises government agencies. Most of their 850 members are in the U.S.A., but they do have members internationally.

The *Urban Planning Institute of the Socialist Republic of Slovenia* (0504), Ljubljana, Yugoslavia, has started projects on disaster mitigation with regard to regional and urban planning.

The environmental management activities of the *Geography Department, University of Waterloo* (0075), Faculty of Environmental Studies, in Canada, includes research on the flood plain and erosion control management in Southern Ontario and shoreline management of the Great Lakes.

The *Natural Hazards Research and Applications Information Center* (0454), Boulder, U.S.A., has the purpose of strengthening communications between research workers and the individuals, organisations and agencies concerned with public action relating to natural hazards. They hold workshops to bring together selected users and producers of important research relating to natural hazards, and publish a quarterly newsletter (distributed to 5,500), as well as research reports and bibliographies.

The *Norwegian Building Research Institute* (0308), Oslo, Norway, carries out research on buildings damaged by wind or snow for improving their design and construction. The Institute is a national body with 160 paid staff.

The *Institute of Building in the Tropics* (0155), Starnberg, Federal Republic of Germany, has carried out research on earthquake-resistant structures for low-cost housing in El Salvador.

The *Department of City and Regional Planning* (0443), Ohio State University, Columbus, U.S.A., which provides professional education to students, carries out research on prevention and mitigation of natural disasters through land-use planning and policies.

The *Department of Architecture, University of Queensland* (0012), carries out research in

tropical building which has included a study of natural disasters and educational building



design in the Asian region and building design and construction in seismic areas with special reference to Papua New Guinea.

Developing Countries

In relation to human settlements, *Urban Designers Associates, Inc.* (0324), Quezon City, Philippines, carries out research on disaster mitigation due to floods and harsh winds.

Environmental management in the Kafue Basin, Zambia is the concern of the *Biology Department, University of Zambia* (0505). The Basin is being developed for multi-purpose use. Flood control is one aspect of the research.

The *Centre for Himalayan Resources Investigation and Survey* (0184), Rishikesh, India, has made a detailed survey of areas most prone to floods and earthquakes. The Centre, with a paid staff of five, and with the assistance of volunteers, educates local people on conservation techniques. The *Wadia Institute of Himalayan Geology* (0227), Dehra Dun, India, carries out research in earthquake affected areas, landslide problems and engineering geological work.

The *Choqui Experimental Station* (0166), Quezaltenango, Guatemala, after the earthquake of 1976, provided relief assistance in the form of a mobile clinic, construction of earthquake resistant houses, and repair of the potable water system. The work of this organisation is done with volunteers. Other Guatemalan NGOs involved in design and building of earthquake resistant housing are the *Mesoamerican Centre for Appropriate Technology* (0167), Guatemala, and the *Association for Scientific Research of the Plateau* (0164), Quezaltenango.

In El Salvador, the *Institute of Urban Housing*, (0116), San Salvador, is concerned with improving the construction and design of low-cost housing for people living along river banks and subject to landslides.

The *School of Research and Training in Earthquake Engineering* (0218), Roorkee, India, carries out research on building and design of earthquake-resistant structures.

The *Structural Engineering Research Centre* (0221) Madras, India, has been rendering services for rebuilding of structures and rehabilitation of people affected by natural disasters such as cyclones and floods. Currently they are researching problems of structural dynamics which will help in the design of earthquake-resistant structures. The work is carried out entirely

by the paid staff, of which eighty-eight are professionals.

Flood disaster mitigation by the construction of embankments, building canals and intensive tree planting schemes are carried out by the *Bangladesh Volunteer Service* (0035), Dacca. They carry out much of their work through the assistance of the communities in which they work and have a paid staff of thirty and the voluntary assistance of one hundred and eleven.

(iii) Education International

Education material on floods is produced by the *International Youth Federation for Environmental Studies and Conservation* (0107), IYF, Skanderborg, Denmark. They are interested in showing the link between the occurrence of floods and forestry policies and ways to take practical steps to prevent floods. IYF is a youth organisation and in Denmark they have one paid staff member and voluntary help from 34, but they have member organisations all over the world.

Developed Countries

A public programme was run by the *Institute on Man and Science* (0462), Rensselaerville, U.S.A., as a public enquiry into the meaning, consequences, and resolution of both man-made and natural disasters as experienced in cities and towns in which they used hypothetical disaster situations.

The *Field Studies Council* (0386), Shrewsbury, England, carries out research on the drainage basin and its hydrology, and the factors leading to the build-up of flood situations. They maintain field centres which run one week courses in the natural sciences such as natural history, geology and zoology. The council has a paid staff of 179 and the membership totals 7,000.

Developing Countries

The *Agricultural Development Agencies in Bangladesh* (0034), Dacca, has served as a disaster relief centre and has prepared a disaster preparedness manual. The organisation has a staff of seven and a membership of forty-five. They serve as an information centre and coordinating body for seminars and workshops on agricultural subjects.

Research and teaching on environmental education is carried out by the *Wau Ecology Institute* (0317), Papua New Guinea. Part of their activities concern the reduction of landslides and floods by forest protection and replacement, contour-moulding etc.

B. Disaster Relief International

The *World Association of Girl Guides and Girl Scouts* (0424), London, England, has members throughout the world who are frequently involved in providing emergency relief in the case of natural disasters. Examples of this work are relief provided to people of Western Australia during a prolonged drought; following a cyclone in India when, with the Scouts, they provided food, clothing and funds; in Italy following the Friuli earthquake they helped in temporary housing camps; after floods in Manila, and earthquakes and tidal waves in Mindanao, Philippines, they provided emergency relief and helped distribute it; in Syria and Jordan relief was again provided during the drought and earth tremours. The Guides have also taken mitigating measures against drought with tree-planting schemes in The Chad.

Oxfam (0409), Oxford, England, provides both emergency relief and disaster mitigation assistance mainly to other non-government organisations working with the local people in developing countries. They commonly assist when there is either flood or drought. For example, in the case of flood: in Tanzania - assistance with repairs to water supplies; Bihar State, India - assistance with coal for brick-firing in post-flood rebuilding; in Honduras - agricultural assistance; and in Brazil - emergency relief for flood victims. In the case of drought: Haiti - relief supplies and seeds; Brazil - assistance in the building of reservoirs for drought-relief, and seeds, as well as water-tanks to drought areas; India - food-for-work support. In the case of cyclone effects in Andhra Pradesh, India - extensive assistance was provided, including vehicles, medical supplies, hospital equipment, rehousing and drainage clearance; in Tamil Nadu, they also provided relief feeding and medical care, rehousing, building materials.

The *League of Red Cross Societies* (0356), Geneva, Switzerland, coordinates assistance to National Societies helping disaster victims, especially in the emergency period, on a world-wide basis, but with particular attention to disaster prone countries. Disaster preparedness assistance, technical and material, is provided to National Societies. Relief concentrates on the basic necessities: food, clothing, shelter, medical aid, social services, tracing missing persons. In specific cases there is also participation in the rehabilitation phase. The League also publishes, organises training courses in disaster relief and preparedness and in the case of disaster preparedness they have provided facilities for storage of relief supplies in places easily accessible for disaster-prone parts of the world - Beirut, Marseilles, Singapore, for example.

The *International Confederation of Catholic Organisations for Charitable and Social Action* (0235), (Caritas Internationalis), Vatican, Italy, provides both emergency relief and assists in reconstruction after natural disasters. They have local groups in various countries who aid in the relief and reconstruction work. They have provided medicines, clothing, food and temporary shelter and reconstruction through housing and rehabilitation programmes. Assistance was given in the Philippines after an earthquake and tidal wave, and in Italy and Guatemala also after earthquakes.

The *Lutheran World Federation* (0357), (LWF), Geneva, Switzerland, provides limited support for efforts undertaken by its member churches or, on an operational level, to areas where LWF has already established service programmes capable of providing the necessary administrative and logistic support for such assistance. At the headquarters level, LWF maintains a full-time office charged with monitoring and responding to disaster within the limits described above. In certain countries, notably in Bangladesh, the LWF has also established an on-going Disaster Preparedness Unit to respond to emergencies and to conduct year-round activities designed to help prevent their occurrences.

The *International Road Transport Union* (0354), Geneva, Switzerland, provides funds for the relief of victims of natural disasters, including the earthquake in Turkey in 1976. Relief assistance was provided in Guatemala after the earthquake by the *Baha'i International Community* (0432), New York, U.S.A.

Developing Countries

Almost annual flooding makes it necessary for the 24 member organisations of the *Bihar Association of Voluntary Agencies* (0178), Patna, India, to be prepared for emergency relief as well as taking steps to mitigate disaster. As emergency relief they provide, for example, money, food and shelter; in the long-term, they have built houses for harijans (the poorest in the community) above the flood level and of a construction which should withstand flooding.

Revista Andina (0092), Santiago, Chile, combines an interest in scientific research of the mountain areas with recreational activities such as skiing and mountain climbing. They include in their activities rescue work in the case of avalanches and floods in the mountain regions. They have both foot and air rescue teams constantly available.

C. Consultancy Services

Intertect (0465), Dallas, U.S.A., is an international cooperative of architects, engineers, planners and social scientists who provide specialised services to international relief organisations in disasters and emergency situations. The guiding principle of Intertect is to foster and maintain research, communications and the dissemination of information in the international relief systems, in order to meet the intricate and complex problems of relief situations with the latest appropriate techniques and workable programmes. As part of their work they publish books on such topics as relief operations, refugee camps and camp planning, emergency shelters, reconstruction housing, pre-disaster planning, disaster preparedness, studies of specific disasters, human waste disposal, drainage and flood protection, medical care, etc.

Their other activities include provision of immediate technical assistance to organisations operating in post-disaster situations; technical assistance and training programmes with governments and voluntary organisations - currently they have two programmes in Peru; evaluation and documentation of the lessons learned from disasters; disaster mitigation which at present includes a programme in Bolivia to develop simple flood control measures for a number of settlements in the jungle area; policy development; research; training and development; and information sharing. A great proportion of their work is undertaken with or financed by other NGOs.

Overseas Development Institute (0408), (ODI), London, England, has provided a consultancy service to an African Government on drought prevention. ODI employs a staff of twenty-five; they provide a centre on research and development issues and publish a periodical and other materials on development.

ngo address list

REF.NO.	NAME AND ADDRESS OF ORGANISATION	RELEVANT CHAPTER
0001	RESEARCH CENTRE ON TERRESTRIAL BIOLOGICAL RESOURCES (Centre de Recherches sur les Ressources biologiques terrestres), B.P. 812, Alger-Gare, Algeria.	3
0002	ARGENTINE INSTITUTE FOR RESEARCH ON ARID LANDS (Instituto Argentino de investigaciones de las zonas aridas), Casilla de Correo 507, Correo Central, Mendoza, Argentina.	6
0003	THE AUSTRALIAN CONSERVATION FOUNDATION, 672 Glenferrie Road, Hawthorn 3122, Australia.	3, 5, 6
0004	AUSTRALIAN UNDERWATER FEDERATION, 24 Victoria Street, New Lambton, N.S.W.2305, Australia.	3
0005	AUTONOMOUS HOUSE GROUP, c/o School of Architecture, University of Sydney, Sydney, Australia.	2, 4
0006	BICYCLE INSTITUTE OF VICTORIA, Box 1961 R, 6 P.O. Melbourne, Victoria 3000, Australia.	6
0007	THE BIO-DYNAMIC AGRICULTURAL ASSOCIATION, c/o P.O. Powelltown, Victoria 3797, Australia.	4
0008	CAMPAIGN AGAINST NUCLEAR ENERGY, 310 Angus Street, Adelaide 500, Australia.	3, 4, 6
0009	CAMPAIGN AGAINST NUCLEAR POWER, Box 238, North Quay, Brisbane, Queensland 4000, Australia.	6
0010	CANBERRA CONSUMERS INCORPORATED, P.O. Box 591, Canberra City, A.C.T., Australia	5, 6
0011	CLEAN AIR SOCIETY OF AUSTRALIA AND NEW ZEALAND, c/o Esso Australighted, Box 191 Eastwood, N.S.W. 2122, Australia.	5
0012	DEPARTMENT OF ARCHITECTURE, University of Queensland, St. Lucia, Queensland, Australia.	2, 7
0013	ENVIRONMENTAL COUNCIL OF NORTHERN TERRITORY, P.O. Box 2120, Darwin 5794, Australia.	3, 6
0014	THE ENVIRONMENTAL COUNCIL OF AUSTRALIA, P.O. Box 2120, Darwin 5794, Australia.	3
0015	THE FEDERATION OF VICTORIA WALKING CLUBS, Box 815F, Melbourne 3001, Australia.	2
0016	INTERNATIONAL GEOGRAPHICAL UNION, School of Geography, University of New South Wales, P.O. Box 1, Kensington, N.S.W. 2033, Australia.	3
0017	THE INTERNATIONAL SOLAR ENERGY SOCIETY, P.O. Box 52, Parkville, Victoria 3052, Australia.	4, 6
0018	THE MURRAY VALLEY DEVELOPMENT LEAGUE, P.O. Box 359, Albury, N.S.W. 2640, Australia.	3, 6
0019	NATURAL HISTORY SOCIETY OF SOUTH AUSTRALIA, 23 Sunset Strip, Athelstone 5076, Australia.	6
0020	NATURE CONSERVATION SOCIETY OF SOUTH AUSTRALIA, P.O. Box 751, Adelaide, Australia	3
0021	SYDNEY UNIVERSITY ECO-TECH WORKSHOP, Sydney, N.S.W. 2006, Australia.	6
0022	TASMANIAN ENVIRONMENT CENTRE, 102 Bathurst Street, Hobart, Tasmania 7000, Australia.	6
0023	TASMANIAN WILDERNESS SOCIETY, c/o Tasmanian Environment Centre, 102 Bathurst Street, Hobart, Tasmania 7000, Australia.	6
0024	URBAN RESEARCH UNIT, Australia National University, Box 4, Canberra, A.C.T.2600, Australia.	2
0025	VAN DIEMAN'S GULF - REGIONAL ECOLOGY CENTRE, Camp Concern, c/o Post Office Humpty Doo, Darwin NT 5791, Australia.	3
0026	WORKING GROUP ON DESERTIFICATION IN AND AROUND ARID LANDS, University of New South Wales, P.O. Box 1, Kensington, N.S.W. 2033, Australia.	3
0027	THE YOUNG WOMEN'S CHRISTIAN ASSOCIATION, 68 Powlett Street, East Melbourne 3002, Victoria, Australia.	2
0028	AUSTRIAN GARDEN AND LANDSCAPE ARCHITECTS, Parkring 12, Vienna, Austria.	2
0029	THE AUSTRIAN INSTITUTE OF REGIONAL PLANNING, A-1011 Vienna, Franz Josefskai 27, Austria.	3, 6
0030	THE AUSTRIAN WATER RESOURCES AND WATER MANAGEMENT ASSOCIATION, An der Huelben 4/6, Vienna A-1010, Austria.	5
0031	THE INSTITUTE FOR ENVIRONMENTAL RESEARCH, Hilmteichstr 75A, A-8010 Graz, Austria.	2, 3, 6
0032	THE INTERNATIONAL INSTITUTE FOR APPLIED SYSTEMS ANALYSIS, 2361 Laxenburg, Austria.	6
0033	INTERNATIONAL WORKING SOCIETY OF DANUBE RESEARCH, Institut fur hydrobiologie, Universitat fur Bodenkultur, 1180 Vienna, Faistmatekstrabe 4, Austria.	5
0034	AGRICULTURAL DEVELOPMENT AGENCIES, P.O. Box 5045 Dacca, Bangladesh.	4, 6, 7
0035	BANGLADESH VOLUNTEER SERVICE, 55 Dilkusha Commercial Area, Dacca 2, Bangladesh.	3, 7
0036	CARIBBEAN CONSERVATION ASSOCIATION, Savannah Lodge, The Garrison, St. Michael, Barbados.	3

0037	APPROPRIATE TECHNOLOGY FOR DEVELOPING COUNTRIES, Blijde Inkomstst Raat 9, Leuven 300, Belgium.	4
0038	CENTRE FOR INTERDISCIPLINARY RESEARCH ON DEVELOPMENT (Centre pour la Recherche interdisciplinaire sur le developpement), Rue Valduc 152, 1160 Brussels, Belgium.	6
0039	CHRISTIAN UNION OF BUSINESS EXECUTIVES (Union internationale chretienne des dirigeants d'entreprise), 49 Avenue d'Auderghem, Brussels 1040, Belgium.	5
0040	THE EUROPEAN ASSOCIATION OF INSTITUTIONS FOR COUNTRY PLANNING (Association europeene des institutions d'amenagement rural), 72 Ave. de la Toison'Or, Brussels 1060, Belgium.	3
0041	THE EUROPEAN INSTITUTE OF ECOLOGY AND CANCER (Institut europeen d'ecologie et de cancerologie), rue des Fripiers, 24 bis, 1000 Brussels, Belgium.	5
0042	FLEMISH YOUTH LEAGUE FOR ENVIRONMENT AND NATURE 2000, Bervoestraat 33, Antwerpen 2000, Belgium.	3
0043	THE FRIENDS OF THE FORESTS OF HEVERLEE AND MEERDAAL, Naamse Steenweg 492, Heverlee, Belgium B 3030.	3
0044	GENERAL ACTION COMMITTEE OF THE MAROLLES (Comite general d'action des marolles), 41 place du Jeu de balle, Brussels 100, Belgium	2
0045	INTER-ENVIRONMENT (Inter-environnement), 25 rue d'Arlon, Brussels B-1040, Belgium	3
0046	THE INTERNATIONAL IRON AND STEEL INSTITUTE, Avenue Hamoir 14, B-1180 Brussels, Belgium.	5
0047	INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS (Union geodesique et geophysique internationale), Observatoire Royal de Belgique, Avenue circulaire 3, Brussels 1180, Belgium.	7
0048	SERVICE BUREAU FOR PLAYGROUNDS AND RECREATION, Boulevard de l'Empereur, Brussels 1000, Belgium.	2
0049	BERMUDA BIOLOGICAL STATION FOR RESEARCH INC., St. George's West 1-15, Bermuda.	3, 6
0050	INSTITUTE OF RESEARCH ON CULTURE AND POPULAR EDUCATION (Instituto de investigacion Cultural para Educacion Popular), Casilla 1016, Oruro, Bolivia.	3
0051	THE SOCIAL AND ECONOMIC DEVELOPMENT CENTER (Centro para el desarrollo social y economico), Casilla 1420, Cochabamba, Bolivia.	2
0052	KWENENG RURAL DEVELOPMENT ASSOCIATION, Private Bag 7, Molepolole, Botswana.	3, 5
0053	MOCHUDI FARMERS, P.O. Box 208, Mochudi, Botswana.	4
0054	PELEGANO VILLAGE INDUSTRIES, P.O. Box 464, Gaborone, Botswana.	2, 3, 5, 6
0055	AGROMAX AGRICULTURE AND STOCK LTD. (Agromax Agricultura e pecuaria ltda.), Caixa postal 6479, Av.23 de Maio 3041, Sao Paulo, Brazil.	3, 4
0056	ASSOCIATION OF AGRONOMISTS OF THE STATE OF SAO PAULO (Associacao de engenheiros agronomos do estado de Sao Paulo), rua 24 de maio, No.104/10 Andar, Sao Paulo, Brazil.	2, 3, 6
0057	ASSOCIATION FOR SAO CARLOS ENVIRONMENT PROTECTION, Sao Carlos, Brazil.	6
0058	ENVIRONMENT PROTECTION SOCIETY (Sociedade protetora do ambiente), rua Hermas Braga 421, Campinas, Brazil.	3
0059	SOCIETY FOR THE DEFENCE OF THE BRAZILIAN COAST (Sociedade de defesa do litoral Brasileiro), rua Bocaina 130-Perdizes, 01311 Sao Paulo, Brazil.	3
0060	THE TECHNOLOGICAL RESEARCH INSTITUTE (Instituto de pesquisas tecnologici), Cidade Universitaria, Caixa Postal 7.141, Sao Paulo, Brazil.	2
0061	THE SCIENTIFIC AND TECHNICAL UNIONS OF BULGARIA, Sofia 100, Rakovski Str 108, Bulgaria.	4
0062	PAN AFRICAN INSTITUTE FOR DEVELOPMENT (Institut Panafricain pour le Developpement), B.P. 4056, Douala, Cameroun.	3
0063	ALBERTA WILDERNESS ASSOCIATION (no current address)	6
0064	THE AMALGAMATED CONSERVATION SOCIETY, Box 741, Victoria, B.C. V8W 2P9, Canada.	3
0065	B.C. RESEARCH, 3650 Westbrook Mall, Vancouver, B.C. V6S 2L2, Canada.	3, 4, 5
0066	CANADIAN COALITION FOR NUCLEAR RESPONSIBILITY, 104-2127 West 40th Street, Vancouver B.C. V6M 1W4, Canada.	3, 6
0067	CANADIAN SCIENTIFIC POLLUTION AND ENVIRONMENTAL CONTROL SOCIETY, 1603 West 4th Avenue, Vancouver BC V6J 1L8, Canada.	6
0068	CANTDU, P.O. Box 342, Goderich, Ontario N7A 1M3, Canada.	6
0069	CENTRE ECOLOGIQUE DE PORT AUX SAUMONS, C.P. 1000, Riguard, Quebec, Canada.	3
0070	CITIZENS ASSOCIATION TO SAVE THE ENVIRONMENT, 6002 W. Saanich Road, R.R. 7 Victoria B.C., Canada.	3, 6
0071	THE COMMUNITY PLANNING ASSOCIATION OF CANADA, P.O. Box 6501, Saint John E2L 4R9, New Brunswick, Canada.	4, 6
0072	THE CONSERVATION COUNCIL OF ONTARIO, 45 Charles Street, Toronto, Ontario M4Y 1S2, Canada.	1, 3, 6
0073	CONSUMERS ASSOCIATION OF CANADA, 103/163 W. Hastings, Vancouver V6B 1H5, Canada.	5, 6
0074	ENERGY PROBE, 43 Queens Park, East Toronto, Ontario M5S 2C3, Canada.	2, 3, 4, 6

0075	GEOGRAPHY DEPARTMENT, Faculty of Environmental Studies, University of Waterloo, Waterloo, Ontario, Canada.	7
0076	INTERNATIONAL UNION OF GEOLOGICAL SCIENCES, Room 177, 601 Booth Street, Ottawa, Ontario K1A 0E8, Canada.	7
0077	KANANSKIS, UNIVERSITY OF CALGARY, Calgary, Alberta T2N 1N4, Canada.	6
0078	MINIMUM COST HOUSE, McGillis, Canada.	2
0079	THE ONTARIO FEDERATION OF ANGLERS AND HUNTERS, Box 1269, Cambellford, Ontario, Canada.	2
0080	PLANNED PARENTHOOD FEDERATION OF CANADA, 1226A Wellington Street, Ottawa, Ontario K1Y 9Z9, Canada.	5
0081	POLLUTION PROBE, 43 Queens Park Crescent, East Toronto, Ontario M5S 2C3, Canada.	3, 5
0082	PROJECT NORMALISATION (Projet normalisation de la vie des handicapés physiques), 2375 Macneil Road, Montreal, Quebec H3R 2X1, Canada.	5
0083	REGIONAL RESOURCES PROJECT NO.1, Box 117, Carbon, Alberta, Tomolo, Canada.	5
0084	ROYAL ARCHITECTURAL INSTITUTE OF CANADA, 151 Slatter Street, Suite 1104, Ottawa K1P 5H3, Canada.	2, 6
0085	SASKATOON ENVIRONMENTAL SOCIETY, Box 1372, Saskatoon, Canada.	6
0086	SAVE TOMORROW OPPOSE POLLUTION, Box 1633, Edmonton, Alberta T5J 2N9, Canada.	5, 6
0087	SIERRA CLUB OF ALBERTA, Western Canada Chapter Group, 3019 Beil Avenue N.W., Calgary, Alberta T2L 1K6, Canada.	3
0088	WEST COAST ENVIRONMENTAL LAW ASSOCIATION, 207 West Hastings Street, Suite 102, Vancouver V6B 1H7, B.C., Canada.	6
0089	THE YOUNG CHRISTIAN AGRICULTURISTS (Jeunesse Agricole Chrétienne), Box 857, N'Djamena, Chad.	4
0090	THE INDUSTRIAL CORPORATION FOR THE REGIONAL DEVELOPMENT OF THE BIO-BIO REGION (Corporación industrial para el desarrollo regional del Bio-Bio), Anibal Pinto 372-OF 72, Casilla 2177, Concepción, Chile.	4, 6
0091	THE LATIN AMERICAN AND ASIAN LOW-INCOME HOUSING SERVICE, Casilla 871, Santiago, Chile.	2
0092	REVISTA ANDINA (Club Andino de Chile), Casilla Postal 10332, Santiago, Chile.	7
0093	COLUMBIAN SOCIETY OF ECOLOGY (Sociedad Colombiana de Ecología), Apartado Aéreo 8674, Bogotá, Colombia.	6
0094	ECOLOGICAL GROUP OF THE UNIVERSITY OF TOLIMA (El Grupo Ecológico del Tolima), Apartado Aéreo 1013, Ibagué, Colombia.	2, 3, 5
0095	THE HOUSING RESEARCH FOUNDATION, Colombia (no current address).	2
0096	INTER-AMERICAN PLANNING SOCIETY, Carrera 16 No. 39-82, Apartado Aéreo 21573, Bogotá, Colombia.	3
0097	THE INTERNATIONAL CENTRE OF TROPICAL AGRICULTURE (Centro internacional de agricultura tropical), Apartado Aéreo 67-13, Cali, Colombia.	4
0098	THE NATIONAL ASSOCIATION OF MANUFACTURERS (Asociación nacional de industriales andi), Apartado 997, Medellín, Colombia.	3, 4, 6
0099	COSTA RICAN ASSOCIATION FOR THE CONSERVATION OF NATURE (Asociación costarricense para la conservación de la naturaleza), Apartado 8-3870, San José, Costa Rica	3
0100	ENVIRONMENTAL EDUCATION PROGRAMME, State University (Universidad estatal a distancia), Apartado No. 2, Plaza González Víquez, San José, Costa Rica.	6
0101	FRIENDS OF NATURE: INTER-AMERICAN ASSOCIATION FOR THE STUDY AND PROTECTION OF NATURE (Amigos de la naturaleza), Apartado 162, Guadalupe, Costa Rica.	2, 3
0102	INTER-AMERICAN ASSOCIATION FOR STUDIES IN DEFENCE OF THE HUMAN ENVIRONMENT (Estudio y defensa del medio humano), P.O. Box 162, Guadalupe, Costa Rica.	3
0103	TROPICAL SCIENCE CENTRE (Centro científico tropical), Apartado 8-3870, San José, Costa Rica.	3, 4
0104	THE ASSOCIATION OF NATURE FRIENDS AND MOUNTAINEERS, Box 225, Limassol, Cyprus.	3
0105	ACOUSTICAL LABORATORY, Lundtoftevej 100, Lyngby, D.K. 2800, Denmark.	5
0106	ENVIRONMENTAL CONTROL STUDIES, Farimagsgade 2D, Copenhagen D.K. 1353, Denmark.	3
0107	INTERNATIONAL YOUTH FEDERATION FOR ENVIRONMENTAL STUDIES AND CONSERVATION, Klostermølle Klostermøllevej 46, D.K. 8660 Skanderborg, Denmark.	3, 6, 7
0108	LABORATORIES FOR ENERGETICS, Bygning 403, Danmarks Tekniske Højskole, Lyngby, Denmark.	6
0109	NIELS BOHR'S INSTITUTE, Blegdamsvej 17, 2100 Copenhagen, Denmark.	6
0110	ORGANISATION FOR RENEWABLE ENERGY, Willemoesgade 14, 2100 Copenhagen, Denmark.	6
0111	THE WATER QUALITY INSTITUTE, 11 Agern Alle, D.K. 2970 Hørsholm, Denmark.	3, 4, 5
0112	CENTRE FOR INTEGRAL TRAINING FOR AGRICULTURE AND HUSBANDRY (Centro de capacitación agropecuaria integral), Casilla 757, Puyo, Pastaza, Ecuador.	3
0113	THE INTEGRATED TRAINING CENTRE FOR PASTAZA PEASANT, Centro de capacitación agropecuaria integral, Casilla 757, Puyo, Pastaza, Ecuador.	4
0114	THE RIO PALENQUE SCIENCE CENTRE (Centro científico río Palenque), Department of Biology, Universite catolique del Ecuador, Apartado 2184, Quito, Ecuador.	3

0115	SYSTEMS ANALYSIS OF MEDITERRANEAN DESERT ECOSYSTEMS OF NORTHERN EGYPT, P.O. Box 589, Alexandria, Egypt.	2, 3, 4
0116	INSTITUTE FOR URBAN HOUSING (Instituto de vivienda urbana), Colonia Libertad, San Salvador, El Salvador.	2, 3, 4, 7
0117	THE INSTITUTE OF PATHOBIOLOGY, Nat'l University, Box 1176, Addis Ababa, Ethiopia.	4
0118	THE FIJI NATIONAL YOUTH COUNCIL, G.P.O. 961, Suva, Fiji.	3
0119	THE BUILDING INFORMATION INSTITUTE, Lonnrotinkatu 20B, 00120 Helsinki 12, Finland.	2
0120	DEPARTMENT OF ENVIRONMENTAL CONSERVATION, University of Helsinki, Viiki SF-00710, Helsinki 71, Finland.	3, 5
0121	THE FINNISH YOUTH NATURE FEDERATION, Lonnrotink 17B, Helsinki 00120, Finland.	6
0122	NATURE AND ENVIRONMENT PROTECTION, Lonnrotsgatan 17B6, SF-00120, Helsinki 12, Finland.	3, 6
0123	THE ASSOCIATION OF JOURNALISTS AND WRITERS FOR THE PROTECTION OF NATURE AND THE ENVIRONMENT (Association des journalistes et ecrivains pour la protection de la nature et de l'environnement), 57 rue Cuvier, 75005 Paris, France.	4
0124	BUREAU VERITAS, 35 rue Paul Vaillant Couturier, Levallois/Perret 92307, France.	6
0125	CENTER FOR EXCHANGE AND THE PROMOTION OF CRAFTSMEN IN ZONES TO BE EQUIPPED (Centre d'echanges et promotion des artisans en zones a equiper), 2 rue d'Hauteville, Paris 75010, France.	5
0126	THE CENTRE FOR RESEARCH ON WELL-BEING (Centre de recherche sur le bien-etre), 140 rue du chevaleret, Paris 75013, France.	2
0127	THE COMMITTEE FOR THE DEFENSE OF NATURAL AREAS (Comite de defense des sites naturels), 33 Allee Leon Gambetta, 13009 Marseille, France.	3
0128	ECOLOGY AND SURVIVAL (Ecologie et Survie), 10 Avenue de Lattre de Tassigny, Mulhouse 68100, France.	4, 6
0129	THE EUROPEAN CENTRE FOR ENVIRONMENTAL PROBLEMS (Centre d'etudes Europeen pour les problemes de l'environnement marin), 141 Boulevard Saint Germain, 75006 Paris, France.	4
0130	FEDERATION FOR THE STUDY AND PROTECTION OF THE NORTH OF FRANCE (Federation Nord Nature), University of Sciences, Animal Biology, B.P. 36, 59650 Villeneuve-d'Asoq, France.	6
0131	FIGHT FOR MANKIND (Combat pour l'homme), 7 rue Boucicaut, F-75015 Paris, France.	3
0132	THE FRENCH FEDERATION OF THE SOCIETIES OF PROTECTION OF NATURE (Federation francaise des societes de protection de la nature), 37 rue d'pujos, Rochefort 17300, France.	3, 6
0133	FRENCH LEAGUE FOR PROTECTION OF BIRDS (Ligue francaise pour la protection des oiseaux), 57 rue Cuvier, Paris 75005, France.	3
0134	G.R.E.T. (Group de recherche sur les techniques rurales), 34 rue Dumont d'Urville, 75116 Paris, France.	4
0135	THE INTERNATIONAL CENTRE FOR INDUSTRY AND THE ENVIRONMENT, 26 rue de Tourville B.1, St. Germain-en-Laye 78100, France.	5
0136	INTERNATIONAL COMMISSION OF AGRICULTURAL ENGINEERING (Commission internationale du genie rural), 17-21 rue de Javel, Paris 75015, France.	4
0137	INTERNATIONAL COUNCIL OF MONUMENTS AND SITES, Hostel Saint Aignan, 75 rue de Temple, Paris 75003, France.	2
0138	INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS 51 Boulevard de Montmorency, Paris 75106, France.	6
0139	INTERNATIONAL FEDERATION OF AGRICULTURAL PRODUCERS (Federation internationale des producteurs agricoles), 1 rue d'Hauteville, 75010 Paris, France.	3, 4
0140	THE INTERNATIONAL FEDERATION OF ORGANIC AGRICULTURE MOVEMENTS, c/o Nature et Progres, 3 chemin de la Bergerie, 91700 Ste-Genevieve-des-Bois, France.	4
0141	INTERNATIONAL REAL ESTATE FEDERATION (Federation internationale des professions immobilierses), 68 rue des Archives, Paris 3e 75003, France.	6
0142	INTER-PROFESSIONAL TECHNICAL CENTRE FOR AIR POLLUTION STUDIES (Centre inter-professional technique d'etudes de la pollution atmospherique), 28 rue de la source, 75016 Paris, France.	5
0143	LABORATORY OF LA ROQUETTE (Laboratoire de la Roquette contre la faim), Saint Bauzille de Putois 34190 France.	4
0144	NATIONAL SCIENTIFIC AND TECHNOLOGICAL ASSOC. FOR YOUTH (Association nationale sciences techniques jeunesse), Palais de la decouverte, Avenue Franklin Roosevelt 008, Paris 75008, France.	3, 4
0145	PAUL EMILE VICTOR GROUP FOR THE DEFENSE OF MAN AND HIS ENVIRONMENT (Groupe Paul-Emile Victor pour la defense de l'homme et de son environnement) 29 rue du Mont Valerien, St. Cloud, France.	3
0146	PEASANT HOMES (Maison Paysannes de France), 13 rue de l'Abbe Gregoire, 92 Issy les Moulineaux, France.	2
0147	SCET INTERNATIONAL, 5-7 rue Bellini, F-92806 Puteaux, France.	2
0148	SCIENTIFIC COMMITTEE ON PROBLEMS OF THE ENVIRONMENT, 51 Blvd.de Montmorency, Paris 75016, France.	3

0149	SPACE FOR TOMORROW (Espace pour demain), 7 rue Fu Laos, 75015 Paris, France.	2
0150	AGRAR-UND HYDROTECHNIK GmbH, CONSULTING ENGINEERS, Postfach 60, D-4300 Essen 1, Fed.Rep.Germany.	3, 4
0151	THE GERMAN DEVELOPMENT ASSISTANCE ASSOCIATION FOR SOCIAL HOUSING, Bismarckstrabe 7, Cologne, Fed.Rep.Germany.	2
0152	GERMAN ENVIRONMENT ACTION, 415 Krefeld, Kempener Alle, Fed.Rep.Germany.	3
0153	GERMAN WATER PROTECTION UNION, Pennauer Str60, D-5300 Bonn, Fed.Rep.Germany.	3
0154	GERMAN WORKERS UNIT FOR NOISE POLLUTION, Graf-Recke-Stabe 84, 4000 Dusseldorf, West Germany.	5
0155	INSTITUTE FOR BUILDING IN THE TROPICS, Waldschmiedstr. 6A, Starnberg 8130, Fed.Rep.Germany.	2, 6, 7
0156	THE INSTITUTE ON HOUSING AND ENVIRONMENT, Annastrasse 15, Fed.Rep.Germany.	2
0157	INTERNATIONAL WORKING GROUP FOR SPORT AND LEISURE FACILITIES, P.F. 450 568, Cologne D-5000, Fed.Rep.Germany.	3, 6
0158	THE RESEARCH INSTITUTE FOR INTERNATIONAL TECHNO-ECONOMIC COOPERATION, Technical University of Aachen, Henricistr 50, 5100 Aachen, Fed.Rep.Germany.	3, 4
0159	RUHR PLANNING AUTHORITY, Kronprinzenstrasse 35, Essen 4300, Fed.Rep.Germany.	2
0160	THE GHANA YOUNG FARMERS CLUBS, National Secretariat, P.O. Box 195, Cape Coast, Ghana.	2, 3
0161	SCIENCE EDUCATION PROGRAMME FOR AFRICA, P.O. Box 9169, Airport, Accra, Ghana.	3
0162	THE WEST AFRICAN BUILDING AND RESEARCH INSTITUTE, Box 40, Kumasi, Ghana.	2
0163	HELLENIC ASSOCIATION ON ENVIRONMENTAL POLLUTION, 14 Xenofontos Street, Athens 118, Greece.	5
0164	ASSOCIATION FOR SCIENTIFIC RESEARCH OF THE PLATEAU (Investigaciones cientificas asociadas del Altiplano), Apartado Postal 159, Quezaltenango, Guatemala.	6
0166	THE CHOQUI EXPERIMENTAL STATION (Estacion experimental choqui), Apartado Postal 153, Quezaltenango, Guatemala.	3, 4, 7
0167	MESOAMERICAN CENTRE FOR APPROPRIATE TECHNOLOGY (Centro Mesoamericano de estudios sobre tecnologia apropiada), Apartado postal 1160, Guatemala, Guatemala.	3, 4, 6, 7
0168	THE INDUSTRIAL INFORMATION CENTRE (Centro de informacion industrial), Universidad nacional autonoma de Honduras, Tegucigalpa D.C., Honduras C.A.	4, 6
0169	THE SANITARY BOARD OF THE URBAN COUNCIL, Hong Kong, Hong Kong.	2
0170	TRADE UNIONS INTERNATIONAL OF CHEMICAL, OIL AND ALLIED WORKERS (Union internationale des syndicats des industries chimique, du petrole et similaires), 1415 Budapest, Hungary.	5
0171	ICELANDIC FEDERATION OF LABOUR, Grensasvegur 16, Reykjavik 108, Iceland.	5
0172	THE ICELANDIC SOCIETY FOR THE PROTECTION OF BIRDS, Braedraborgaerstig 26, Reykjavik, Iceland.	3
0173	ACTION FOR AGRICULTURAL RENEWAL IN MAHARASHTRA, 3C Shankarshet Road, Poona 411 002, Maharashtra, India.	3
0174	AGRICULTURAL TOOLS RESEARCH CENTRE, Suruehi Vasahat, Bardoli, Dist.Surat, Gujarat 394601, India.	6
0175	THE ANAND NIKETAN ASHRAM TRUST, P.O. Rangpur, via Kasindra, Dist.Vadadara, Gujarat 391140, India.	2
0176	THE APPROPRIATE TECHNOLOGY DEVELOPMENT ASSOCIATION, Ghandhi Bhawan, Box 311, Lucknow, U.P. 226001, India.	2, 4, 6
0177	BANWASI SEVA ASHRAM, P.O. Govindpur, Dist. Mirzapur, U.P., India.	4, 6
0178	BIHAR ASSOCIATION OF VOLUNTARY AGENCIES, Sadaquat Ashram, Patna (Bihar), India.	3, 7
0179	THE BIRBAL SAHNI INSTITUTE OF PALAEOBOTANY, 53 University Road, Lucknow 226007, U.P., India.	3
0180	BOMBAY CIVIC TRUST, Jehngin Art Gallery, 1st Floor Mahatma Gandhi Road, Bombay 400023, India.	5
0181	BOSE RESEARCH INSTITUTE, 93/1 Acharya Prafulla Chandra Road, Calcutta 700009, India.	3
0182	THE CENTRAL FOOD TECHNOLOGICAL RESEARCH INSTITUTE, Mysore 570013, India.	4
0183	CENTRAL YOUNG MIZO ASSOCIATION, Aizawl, Mizoram State, India.	4
0184	CENTRE FOR HIMALAYAN RESOURCES, INVESTIGATION AND SURVEY, Rishikesh, U.P., India.	3, 7
0185	CENTRE OF SCIENCE FOR VILLAGES, 739 JNU, New Delhi, India 110057.	3 3
0186	CHRISTIAN FELLOWSHIP HOSPITAL, Oddanchatram 724619, Madurai, India. 62461.	3, 4
0187	THE COMMITTEE ON SCIENCE AND TECHNOLOGY IN DEVELOPING COUNTRIES, C/o Indian Institute of Science, Bangalore 560012, India.	4, 5
0188	DEPT. OF ARCHITECTURE AND REGIONAL PLANNING, Institute of Technology, Kharagpur, India.	3

0189	DEPARTMENT OF MECHANICAL ENGINEERING, College of Agricultural Engineering, Punjab Agricultural University, Ludhiana, Pb, India.	2, 6
0190	THE EASTERN REGIONAL ORGANISATION FOR PLANNING AND HOUSING, 4-A Ring Road, Indraprastha Estate, New Delhi 110002, India.	2
0191	GANDHI MEMORIAL TRUST, Rajghat, New Delhi 110002, India.	4
0192	GEOBIO, DEPARTMENT OF BOTANY, University of Jodhpur, Box No. 14, Jodhpur 342001, India.	3, 4
0193	GONDWANA WELFARE CENTRE, Tamia, Chindwada District, India.	3
0194	GRAM SEVA SAMITI TARONDA NITAYA, P.O. Raisalper, Dist.HQ Shangabad, Madhya Pradesh, India.	4, 6
0195	HIGHLANDERS' NEW LIFE SOCIETY, Village Silyara via Ghansali, Tehri Gashwal, U.P. 249155, India.	6
0196	HIGH RANGE GAME PRESERVATION ASSOCIATION, Nettigudi Estate, Munna, Keralapo, India.	3.
0197	HIMALAYA SEVA SANGH, Rajghat Colony, New Delhi 11000, India.	3
0198	INDIAN ASSOCIATION FOR WATER POLLUTION CONTROL, c/o Neeri, Nehru Marg, Nagpur 10, India.	3
0199	THE INDIAN INSTITUTE OF TECHNOLOGY, 11T Kampur, P.O. Kanpur 16, India 208016.	4
0200	THE INDORE-ECO SOCIETY, 28 Vyas Tala Juni Indore, Indore (M.P.) 452001, India.	3
0201	THE INDUSTRIAL TOXICOLOGY RESEARCH CENTRE, P.O. Box 80, M.G. Marg, Lucknow 226001, India.	5
0202	INSTITUTE OF DEVELOPMENT STUDIES, Mansa Gangotri, Mysore 57006, India.	2, 5
0203	THE INTERNATIONAL COMMISSION ON IRRIGATION AND DRAINAGE, Central Office 48 Nyaya Marg, Chanakyapuri, New Delhi 110021, India.	3
0204	INTERNATIONAL CROPS RESEARCH INSTITUTE FOR SEMI ARID TROPICS, 1-11-256 Begumbet, Hyderabad 500016, A.P. India.	4
0205	JAMNALAL BAJAJ CENTRAL RESEARCH INSTITUTE FOR VILLAGE INDUSTRIES, Maganwadi, Wardhadha, P.O. Box 4, India.	4
0206	THE KASTURBA LADIES UPLIFTMENT ORGANISATION, Lakshmi Ashrama, Kausani, Almora 263639, India.	3
0207	KHADI AND VILLAGE INDUSTRIES COMMISSION, Gamodaya Cooper Road, Vileparle West, Bombay 400054, India.	6
0208	KISAN BHARATI MEWAD, P.O. Jagudan, Dist.Mahesana, Gujarat, India.	4
0209	KISHORE BHARATI (NON-FORMAL EDUCATION), P.O. Balhanwara, via Bankhedhi, Dist. Hoshangabad, Madhya Pradesh 461290, India.	4
0210	THE MEDICINAL PLANTS GARDEN AND HERBARIUM, New Delhi, India.	4
0211	MEDICO FRIEND CIRCLE, 21 Nirman Society, Vadodara, 390005, India.	4
0212	THE MILLIONS OF TREES CLUBS, Sira Gate, Tumkur-Karnataka, India 572101.	3, 6
0213	NATIONAL INSTITUTE OF NUTRITION, Jamia Osmania, Hyderabad 500007, India.	4
0214	THE NATURAL RESOURCES DEVELOPMENT COOPERATIVE SOCIETY LTD., Matrusri, Apartments Hyderguda, Hyderabad 500001, Andhra Pradesh, India.	3, 6
0215	NOVA 2000, CONSULTANTS AND DESIGNERS, D-16 Kailash Colony, New Delhi 110048, India.	4
0216	THE ORISSA ORGANISATION FOR NEW LIFE, P.O. Anjul, Dist.Dhenkanal, Orissa 759122, India.	5
0217	THE SCIENCE EDUCATION CENTRE, Atarra, Banda, U.P. 210201, India.	4, 6
0218	THE SCHOOL OF RESEARCH AND TRAINING IN EARTHQUAKE ENGINEERING, Roorkee University Roorkee U.P. 24762, India.	7
0219	SHRAMABHARATI, P.O. Khadigram, Monghyr Dist., Bihar, India.	2
0220	SRI AUROBINDO SOCIETY, Society House, Pondicherry 605002, India.	2
0221	THE STRUCTURAL ENGINEERING RESEARCH CENTRE, CSIR Campus, Adyar, Madras 600 020, India.	4, 6, 7
0222	TAMULPUR ANCHALIK GRAMDAM SANGH, P.O. Kumarikata, Dist.Kamrup, Assam 751360, India.	2
0223	UDAIPUR ENVIRONMENTAL GROUP, 206 Ashok Nagar, Udaipur, Raj 313001, India.	3
0224	THE VILLAGE RECONSTRUCTION ORGANISATION, 6/9 Brodiepet, Guntur 522002, India.	2
0225	VISAKHA CONSUMERS COUNCIL, 29-8-1 Daba Gardens, Lalita Colony, Visakhapatnam 530004, India.	3
0226	VOLUNTARY HEALTH ASSOCIATION OF INDIA, C-14 Community Centre, Safdariung Development Area, New Delhi 110016, India.	3, 4
0227	THE WADIA INSTITUTE OF HIMALAYAN GEOLOGY, Dehra Dun, 15 Municipal Road, 248001, India.	7
0228	THE XAVIER INSTITUTE OF SOCIAL SERVICE, Purulia Road, Box 9, Ranchi 834001, India.	5

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0229	THE CENTER FOR NATURAL RESOURCE MANAGEMENT AND ENVIRONMENT STUDIES (IPB) Bogor Agricultural University, Jalan Raya, Pajajaran, Bogor, Indonesia.	3, 4
0230	SOCIAL WELFARE GUIDANCE FOUNDATION, 84 Surakarta, Central Java, Indonesia.	2, 3
0231	STUDY GROUP OF STRATEGY ON PLANNING AND DESIGN, Dept. of Architecture ITB, Bandung Institute of Technology, Bandung, Indonesia.	3
0232	THE IRISH CONSERVATION SOCIETY, c/o Dr. R.E. Blackith, Zoology Department, Trinity College, Dublin 2, Ireland.	6
0233	THE INSTITUTE FOR DESERT RESEARCH, Ben-Gurion University, Sede Boqer Campus, Israel.	4
0234	CARITAS BOLIVIA, c/o Caritas Internationalis, 16 Piazza S. Calisto, Rome 00153, Italy.	5
0235	THE INTERNATIONAL CONFEDERATION OF CATHOLIC ORGANISATIONS FOR CHARITABLE AND SOCIAL ACTION, 16 Piazza S. Calisto, 00153 Rome, Italy.	2, 5, 7
0236	KRONOS 1991, via G.b. Vico 20, 00196, Rome, Italy.	3
0237	THE NATURAL AND URBAN ENVIRONMENT, Piazza Fontane Morosse 6-5, 16123 Genoa, Italy.	3, 6
0238	TOWN AND COUNTRY PLANNING ENGINEERING INSTITUTE, Politecnico-Piazza, Piazza Leonardo da Vinci 32, Milan 20133, Italy.	3
0239	JAPAN CENTRE FOR HUMAN ENVIRONMENTAL PROBLEMS, Faculty of Law, Tokyo Metropolitan University, 1 Yakumo, Meguroku, Tokyo, Japan.	3
0240	JAPAN FOREST TECHNICAL ASSOCIATION, No.7 Rokubancho, Chiyoda-Ku, Tokyo, Japan.	5
0241	JISHU-KOZA CITIZENS MOVEMENT, Faculty of Engineering, Dept. of Sanitary and Urban Engineering, University of Tokyo, 7-3-1 Hongo Bunkyo-ku, Tokyo 113, Japan.	5
0242	LABORATORY OF GENETICS, Kyoto University, Kyoto, Japan.	3
0243	THE AFRICAN MEDICAL AND RESEARCH FOUNDATION INTERNATIONAL, Box 30125, Nairobi, Kenya.	4
0244	AFROLIT SOCIETY, P.O. Box 73511, Nairobi, Kenya.	3
0245	AFRICAN WILDLIFE LEADERSHIP FOUNDATION, P.O. Box 48177, Nairobi, Kenya	3
0246	ASSOCIATION OF PUBLIC HEALTH OFFICERS, P.O. Box 21280, Nairobi, Kenya.	2, 3
0247	ENVIRONMENT LIAISON CENTRE, P.O. Box 72461, Nairobi, Kenya.	3
0248	THE HOUSING RESEARCH AND DEVELOPMENT UNIT, P.O. Box 30197, Nairobi, Kenya.	2, 4, 6
0249	INTERNATIONAL COUNCIL FOR RESEARCH IN AGRO-FORESTRY, P.O. Box 30677, Nairobi, Kenya.	3
0250	KENYA CATHOLIC SECRETARIAT, P.O. Box 48062, Nairobi, Kenya.	3
0251	THE KENYA NATIONAL FARMERS UNION, Box 1225, Nakuru, Kenya.	4, 6
0252	NATIONAL CHRISTIAN COUNCIL OF KENYA, P.O. Box 45009, Nairobi, Kenya.	5, 6
0253	NATIONAL COUNCIL OF WOMEN OF KENYA, P.O. Box 43741, Nairobi, Kenya.	6
0254	TUNNEL COMPANY, Fort Tenant, Kenya.	4, 6
0255	WILDLIFE CLUBS OF KENYA, P.O. Box 40658, Nairobi, Kenya.	3
0256	WILDLIFE RANCHING AND RESEARCH, Athi River, Kenya.	3
0257	KOREAN INSTITUTE OF ARCHITECTS, Seoul 110, Korea.	2, 3
0258	ENVIRONMENTAL PROTECTION SOCIETY, P.O. Box 1896, Kuwait, Kuwait.	3
0259	THE PRINCE MOHATO'S AWARD, P.O. Box Ms. 6, Maseru 100, Lesotho.	3
0260	LEAGUE FOR THE STUDY AND PROTECTION OF BIRDS (Ligue Luxembourgeoise pour l'etude et la protection des oiseaux), 32 rue de la foret, Luxembourg.	3
0261	THE LUXEMBOURG NOISE ABATING SOCIETY, (Association Luxembourgeoise contre le bruit), 110 Ave. du Dix-Septembre, Luxembourg, Luxembourg.	2, 5
0262	CHAMBER OF COMMERCE AND INDUSTRY OF MALAWI, Box 258, Blantyre, Malawi.	5
0263	CONSUMERS ASSOCIATION OF PENANG, 306-F Top Floor, Burmah Road (Pulau Tikus), Pulau Penang, Malaysia.	3, 5
0264	ECOLOGY PROGRAMME GROUP, University of Malaya, Dept. of Zoology, Kuala Lumpur, Malaysia.	3
0265	THE ENVIRONMENTAL PROTECTION SOCIETY OF MALAYSIA, P.O. Box 382, Jalan Sultan, Petaling Jaya, Selangor, Malaysia.	2, 3, 5, 6
0266	WORLD WILDLIFE FUND MALAYSIA, P.O. Box 769, Kaula Lumpur, Malaysia.	3
0267	AFRICARE, B.P. 1792, Bamako, Mali.	2
0268	INTERNATIONAL OCEAN INSTITUTE, 101 Royal University of Malta, Msida, Malta	3, 6
0269	MALTA ORNITHOLOGICAL SOCIETY, P.O. Box 498, Valletta, Malta.	3
0270	THE NATURAL HISTORY SOCIETY OF MALTA, 78 St. Trophimus Street, Sliema, Malta.	3
0271	THE MAURITIUS SOCIETY FOR AGRICULTURE AND SUGAR INDUSTRY TECHNOLOGY, c/o S.I.R.I., Reduit, Mauritius.	4
0272	MAURITIUS NATIONAL YOUTH COMMITTEE FOR ENVIRONMENT AND CONSERVATION, c/o Young Farmer's Office, Royal Road, Phoenix, Mauritius.	6

0273	THE MAURITIUS SOCIETY FOR ENVIRONMENT AND CONSERVATION, c/o Young Farmer's Office, Youth House, Phoenix, Mauritius.	3, 5
0274	THE NATIONAL FEDERATION OF YOUNG FARMERS CLUBS, Youth Office, Youth House, Phoenix, Mauritius.	4
0275	THE ECODEVELOPMENT CENTRE (Centro de ecodesarrollo), 11-440 Mexico 11, D.F., Mexico.	2, 3, 6
0276	ENVIRONMENT FOUNDATION (Fundacion medio ambiente), Apartado Postal 6-1088, Mexico, D.F., Mexico.	2, 3, 4, 6
0277	INTER-AMERICAN PLANNING SOCIETY (Sociedad Interamericana de planificacion), Apartado Postal 27-716, Mexico 7 D.F., Mexico.	2
0278	DEVELOPMENT AND CONSULTING SERVICES, Butwal, Nepal.	3, 6
0279	AKTIE STROHALM, Oudegracht 42, Utrecht, Netherlands.	6
0280	CONCAWE - CONSERVATION OF CLEAN AIR AND WATER IN EUROPE, Van Hogenhoucklaan 60, 2596 The Hague TE, Netherlands.	6
0281	THE DUTCH NOISE ABATEMENT SOCIETY, P.O. Box 381, Stieltjesweg, A.J. Delft, Netherlands.	2, 5
0282	EINDHOVEN UNIVERSITY, Postbus 525, Eindhoven, Netherlands.	2
0283	THE EUROPEAN ASSOCIATION FOR RESEARCH ON PLANT BREEDING, P.O. Box 128, Wageningen, Netherlands.	4
0284	THE INSTITUTE OF CULTURAL AND SOCIAL STUDIES, Leiden University, Stationsweg 46, Leiden, Netherlands.	3
0285	INSTITUTE FOR ENVIRONMENTAL EDUCATION, Plantage Middenlaan 41, Amsterdam 1004, Netherlands.	3
0286	INTERNATIONAL COUNCIL FOR BUILDING RESEARCH STUDIES AND DOCUMENTATION, P.O. Box 20704, Rotterdam 3001 J.A., Netherlands.	6, 7
0287	THE INTERNATIONAL SOCIETY FOR SOILLESS CULTURE, P.O. Box 52, Wageningen 67000 A.B., Netherlands.	3,
0288	THE INTERNATIONAL UNION OF LOCAL AUTHORITIES, 45 Wassenaarseweg, The Hague 2018, Netherlands.	2, 3
0289	THE OIL COMPANIES INTERNATIONAL STUDY GROUP FOR CLEAN AIR AND WATER - EUROPE, Van Hogenhoucklaan 60, The Hague 2596 T.E., Netherlands.	5
0290	THE ROYAL DUTCH TOURING CLUB, Wassenaarseweg 229, The Hague 2200, Netherlands.	2
0291	S & L CITIES AND LAND CONSULTANTS FOR COMPREHENSIVE URBAN AND REGIONAL PLANNING, Box 368, 3000 AJ Rotterdam, Netherlands.	2, 3
0292	SMALL EARTH, Postbus 151, Boxtel-5280 A.D., Netherlands.	4
0293	TOOL, Postbus 525, Eindhoven, Netherlands.	2, 4
0294	ASSOCIATION FOR THE SAFEGUARD OF THE NEW CALEDONIAN NATURE (Association pour la sauvegarde de la nature Neo-Caledonienne) 50 rue Anatole France, Noumea, New Caledonia.	6
0295	ACTION FOR ENVIRONMENT, P.O. Box 10-030, Wellington, New Zealand.	6
0296	THE INSTITUTE OF FUEL, 7 Ngahere Street, Stokes Valley, New Zealand.	6
0297	NEW ZEALAND CLEAN AIR SOCIETY, P.O. Box 2363, Christchurch, New Zealand.	5, 6
0298	NEW ZEALAND ECOLOGICAL SOCIETY, P.O. Box 31-007, Christchurch, New Zealand.	6
0299	THE NEW ZEALAND INSTITUTION OF ENGINEERS, 101 Molesworth Street, Molesworth House, Wellington, New Zealand.	5
0300	THE SOIL ASSOCIATION OF NEW ZEALAND, 38 Arran Crescent, Christchurch 6, New Zealand.	4
0301	NEW ZEALAND WORKERS' EDUCATIONAL ASSOCIATION, P.O. Box 10-030, Wellington, New Zealand.	5
0302	THE DEPARTMENT OF GEOGRAPHY, University of Jos, P.M.B. 2084, Jos, Nigeria.	2
0303	NATIONAL CONSUMERS ASSOCIATION OF NIGERIA, P.O. Box 851, Calabar, CR State, Nigeria.	3
0304	THE NIGERIAN INSTITUTE OF MANAGEMENT, 58 Adelabu Street, Surulere, Lagos, Nigeria.	5
0305	PROJECTS DEVELOPMENT INSTITUTE, 3 Independence Layout, P.O. Box 609, Enugu, Nigeria.	3, 4, 5, 6
0306	VOLUNTARY WORK CAMPS ASSOCIATION OF NIGERIA, P.O. Box 2189, Lagos, Nigeria.	3
0307	BIOLOGICAL STATION, Blomsterdalen, N-5065, Norway.	5
0308	THE NORWEGIAN BUILDING RESEARCH INSTITUTE, P.O. Box 322, Blindern, Oslo 3, Norway.	7
0309	THE NORWEGIAN FEDERATION OF TRADE UNIONS, Youngsgate II, Oslo 1, Norway.	5
0310	THE PAKISTAN NATIONAL FEDERATION OF TRADE UNIONS (PNFTU), 406 Qamar House, M.A. Jinnah Road, Karachi 2, Pakistan.	5
0311	THE LABORATORY OF CONSTRUCTION, University of Panama, Panama, Panama.	2
0312	MELANESIAN COUNCIL OF CHURCHES, Box 10155, Boroko, Papua New Guinea.	4

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0313 NEW GUINEA BIOLOGICAL FOUNDATION, P.O. Box 156, Port Moresby, Papua New Guinea.	4	
0314 THE PAPUA NEW GUINEA UNIVERSITY OF TECHNOLOGY, P.O. Box 793, Lae, Papua New Guinea.	4, 5	
0315 PORT MORESBY COMMUNITY DEVELOPMENT GROUP, P.O. Box 8083, Waigini, Papua New Guinea.	2	
0316 SOUTH PACIFIC APPROPRIATE TECHNOLOGY FOUNDATION, Box 6937, Boroko, Papua New Guinea.	3, 4	
0317 WAU ECOLOGY INSTITUTE, P.O. Box 77, Wau, Papua New Guinea.	7	
0318 YANPELA DIDIMAN ASSOCIATION, P.O. Box 39, Banz, Western Highland Province, Papua New Guinea.	4	
0319 THE ASSOCIATION FOR DEFENSE AGAINST ENVIRONMENTAL POLLUTION (Asociacion defensa contra contaminacion ambiental), J.R. Cusco 610 Of.203, Lima 1, Peru.	5	
0320 THE PERUVIAN ASSOCIATION OF SANITARY AND ENVIRONMENTAL ENGINEERING (Asociacion Peruana de ingenieria sanitaria y ambiental), Emilio Fernandez 296-Piso 803, Lima, Peru.	2, 3	
0321 THE INSTITUTE FOR SMALL SCALE INDUSTRIES, E. Virata Hall, UP Campus, Diliman, Quezon City, Philippines.	3, 4, 5	
0322 INTERNATIONAL RICE RESEARCH INSTITUTE, Box 933, Manila, Philippines.	4	
0323 RESEARCH AND PLANNED DEVELOPMENT SYSTEMS INC., 49 10th Street, New Manila, Quezon City, Philippines.	3	
0324 URBAN DESIGNERS ASSOCIATES INC., P.O. Box 53, U.P.Diliman, Quezon City 3004, Philippines.	6, 7	
0325 CENTRE FOR AFRICAN STUDIES, University of Warsaw, Al Zwirki 1 Wigury 93, Warsaw 02 089, Poland.	2	
0326 INTERNATIONAL FEDERATION OF LANDSCAPE ARCHITECTS (Federacion internacional de arquitectos paisajistas), Lisbon, Portugal.	2	
0327 TO LIVE IS NECESSARY - PAPERS ON ECOLOGY AND SOCIETY, Apartado 31, Lagos, Portugal.	4	
0328 THE PORTUGUESE CENTRE FOR WILDLIFE STUDY AND PROTECTION, rua da Boa Hora, 85 R/C E, Porto 1, Portugal.	3	
0329 ENVIRONMENT TRAINING PROGRAMME (Programme formation pour l'environnement), B.P. 3370, Dakar, Senegal.	1, 3, 4	
0330 THE SINGAPORE CHINESE CHAMBER OF COMMERCE, 47 Hill Street, Singapore 6, Singapore.	5	
0331 THE ANTI-NUCLEAR COMMITTEE OF CATALUNA (Comite Antinuclear de Catalunya), Canc C/Bruc 26. 2º, Barcelona 10, Spain.	6	
0332 INSTITUTE OF PYRENEAN STUDIES (Instituto de estudios Pirenaicos), Apartado 64, Jaca (Prov. de Huesca), Spain.	3	
0333 LANKA JATIKA SARVODAYA SHRAMADANA SANGAMAYA, 77 de Soysa Road, Moratuwa, Sri Lanka.	2, 4, 6	
0334 ORGANISATION FOR INDUSTRIAL, SPIRITUAL AND CULTURAL ADVANCEMENT, No.22/4 Albert Crescent, Colombo 7, Sri Lanka.	4	
0335 SRI LANKA WOMEN'S CONFERENCE, 185/1 Dharmapala Mawatha, Colombo 7, Sri Lanka.	3, 5	
0336 THE WILDLIFE AND NATURE PROTECTION SOCIETY, Chaitiya Road, Marine Drive, Fort, Colombo 1, Sri Lanka.	3	
0337 THE CENTRAL ORGANISATION OF SALARIED EMPLOYEES, Linnegatan 14, P.O. Box 5252, S-102 45 Stockholm, Sweden.	5	
0338 METEOROLOGICAL DEPARTMENT, UNIVERSITY OF STOCKHOLM, Arrmenius Laboratory, Stockholm S-10691, Sweden.	6	
0339 THE ROYAL SWEDISH ACADEMY OF SCIENCES, K.V.A. Fack S-10405, Stockholm, Sweden.	5	
0340 THE SWEDISH ASSOCIATION OF LANDSCAPE ARCHITECTS, Odengatan 3, S-114 24 Stockholm, Sweden.	3	
0341 THE SWEDISH WATER AND AIR POLLUTION RESEARCH INSTITUTE, Halsingegaten 43, Box 21060, 10031 Stockholm, Sweden.	4, 5	
0342 AQUA VIVA, 54 Route de Neuchatel, Bienne 2505, Switzerland.	5	
0343 ARCADIE ASSOCIATION AGAINST POLLUTION, C.P. 103, 1211 Geneva 20, Switzerland.	5	
0344 THE BATTELLE MEMORIAL INSTITUTE: GENEVA RESEARCH CENTRE (Institute Battelle: Centre du recherche de Geneva), Carouge CH-1227 Geneva, Switzerland.	3, 5, 6	
0345 BIOFARM COOPERATIVE, CH-4936, Kleindietwil, Switzerland.	3, 4	
0346 COMMITTEE FOR THE DEFENSE OF ANIMALS IN PERIL (Comite d'action pour la defense des animaux en peril), 142 route de la Capite, Cologny 1223, Geneva, Switzerland.	3,	
0347 ECOPLAN INSTITUTE (Institut Ecoplan), 71 Avenue Louis-Casai, 1216 Cointrin, Geneva, Switzerland.	2, 6	
0348 ELEKTRO GmbH, St. Gallerstr 27, CH Wilterthur, Switzerland.	4, 6	
0349 FORUM FOR RESPONSIBLE APPLICATION OF SCIENCE, CH-4113 Fluh, Switzerland.	4	
0350 THE FOUNDATION FOR ENVIRONMENTAL CONSERVATION (Fondation pour le conservation environmental) 15 Chemin F-Lehmann, 1218 Grand-Saconnex, Geneva, Switzerland.	3	

0351	INSTITUTE FOR NATIONAL, REGIONAL AND LOCAL PLANNING, ET H Honggerberg, CH-8093 Zürich, Switzerland.	2, 3
0352	INTERNATIONAL ASSOCIATION AGAINST NOISE (Association internationale contre le bruit), Rebhaldensteig 19, 8700 Kusnacht, Switzerland.	2, 5
0353	THE INTERNATIONAL ELECTROTECHNICAL COMMISSION (Commission electrotechnique internationale), 3 rue varembe, Geneva 20, Switzerland.	7
0354	INTERNATIONAL ROAD TRANSPORT UNION (Union internationale des transports routiers), 3 rue de Varembe, B.P. 44, 1211 Geneva 10, Switzerland.	6, 7
0355	THE INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE AND NATURAL RESOURCES (Union internationale pour la conservation de la nature et de ses ressources), 28 rue Uttins, 1110 Morges, Switzerland.	1, 3
0356	THE LEAGUE OF RED CROSS SOCIETIES (Ligue des societes de la croix-rouge), 17 chemin des Crets, 1211 Geneva 19, Switzerland.	2, 7
0357	THE LUTHERAN WORLD FEDERATION, 150 route de Ferney, 1211 Geneva 20, Switzerland.	2, 7
0358	RESEARCH GROUP FOR INVESTIGATION/PREVENTION OF SILICOSIS, c/o Institute of Pathology, Kantonsspital, CH-8091 Zurich, Switzerland.	5
0359	THE SWISS ALPINE CLUB, Geschäftsstelle, Helvetia platz 4, 3005 Bern, Switzerland.	3
0360	THE SWISS ASSOCIATION FOR TECHNICAL ASSISTANCE, St. Moritzstr 15, Postfach 8042, Zurich, Switzerland.	4
0361	SWISS LEAGUE FOR THE PROTECTION OF NATURE (Ligue Suisse pour la protection de la nature), Wartenbergstrasse 22, P.O. Box 73, CH-4020 Basle, Switzerland.	6
0362	THE SWISS RAMBLERS ASSOCIATION, 1m Hishalm 49, 4125 Riehen, Switzerland.	3
0363	WORLD ASSOCIATION OF GIRL GUIDES AND GIRL SCOUTS, 17 chemin Francois Lehmann, 1218 Grand-saconnex, Geneva, Switzerland.	
0364	WORLD COUNCIL OF CHURCHES, 150 rue de Ferney, Geneva 20, Switzerland.	6
0365	WORLD SCOUT BUREAU, Case Postale 78, 1211 Geneva, 4, Switzerland.	3
0366	WORLD WILDLIFE FUND (Fonds mondiale pour la nature), La Gracieuse, 1110 Morges, Switzerland.	3
0367	WORLD YOUNG WOMEN'S CHRISTIAN ASSOCIATION, 37 Quai Wilson, 1201 Geneva, Switzerland.	3
0368	INSTITUTE OF DEVELOPMENT MANAGEMENT, P.O. Box 604, Morogoro, Tanzania.	5
0369	THE TROPICAL PESTICIDE RESEARCH INSTITUTE, P.O. Box 1002, Arusha, Tanzania.	4
0370	THE ASIAN ENVIRONMENT COUNCIL, 1787-9 New Petchburi Road, Bangkok, Thailand.	6
0371	THE ASIAN INSTITUTE OF TECHNOLOGY, P.O. Box 2754, Bangkok, Thailand.	3
0372	THE FACULTY OF ARCHITECTURE, Silpakorn University, Bangkok 2, Thailand.	4, 6
0373	ECOLOGICAL SOCIETY OF THAILAND, Mahidol University, c/o R.S. Hotel 6th Floor, 269 Larn Luang Road, Bangkok, Thailand.	3, 4, 6
0375	THE INTERNATIONAL CHAMBER OF COMMERCE COMMISSION ON ASIAN AND PACIFIC AFFAIRS, 150 Rajbopit Road, Bangkok 2, Thailand.	5
0376	THE TONGOLESE ASSOCIATION OF CHRISTIAN VOLUNTEERS AT WORK (Association Tongolese des volontaires chretiennes au travail), rue de l'hopital, B.P. 97 Kpalime, Togo.	2
0377	THE UGANDA FRESHWATER FISHERIES RESEARCH ORGANISATION, P.O. Box 343, Jinja, Uganda.	3
0378	THE APPROPRIATE HEALTH RESOURCES AND TECHNOLOGIES ACTION GROUPS, 85 Marylebone High Street, London, U.K.	4
0379	CENTRE FOR ALTERNATIVE INDUSTRIAL AND TECHNOLOGY SYSTEMS, North-East London Polytechnic, Longbridge Road, Dagenham, Essex RM8 2AS, U.K.	5, 6
0380	MARINE ACTION CENTRE, The Bath House, Guydir Street, Cambridge, U.K.	1
0381	THE CONSERVATION TRUST, 24 London Road, Earley Reading, Berks RG6 1AJ, U.K.	6
0382	THE COUNCIL FOR THE PROTECTION OF RURAL ENGLAND, 4 Hobart Place, London SW1W 0HY, U.K.	2, 6
0383	ECOLOGICAL LIFE-STYLES LIMITED, 11 Lodge End, Radlett, Herts, U.K.	2
0384	ENVIRONMENTAL RESOURCES LIMITED, 35A Thayer Street, London W1M 5LH, U.K.	5
0385	FARM AND FOOD SOCIETY, 4 Willifield Way, London NW11 7XT, U.K.	4
0386	FIELD STUDIES COUNCIL, Preston Montford, Montford Bridge, Salop.SY4 1HW, U.K.	3, 7
0387	FRIENDS OF THE EARTH, 9 Poland Street, London, W1V 3DG, U.K.	3, 5, 6
0388	FRIENDS OF THE EARTH, 9 Norfolk Street, Cambridge, U.K.	4
0389	FUTURE STUDIES CENTRE, 15 Kelso Road, Leeds LS2 9PR, U.K.	2
0390	FUTURES, IPC Science and Technology Press, Westbury House, Bury Street, Guildford, Surrey GU2 5AW, U.K.	6
0391	GREEN BAN ACTION COMMITTEE, 77 School Road, Hall Green, Birmingham B28 8JQ, U.K.	6
0392	GREENPEACE London, 6 Ensleight Street, London WC1, U.K.	5

0393	THE HYDROPONIC ADVISORY AND INFORMATION UNIT, 119 Glebe Avenue, Ickenham UB10 8PF, U.K.	3
0394	INSTITUTE OF TERRESTRIAL ECOLOGY, Merelewood Research Station, Grange-over-sands, Cumbria LA11 6JU, U.K.	3, 5, 6
0395	THE INTERMEDIATE TECHNOLOGY DEVELOPMENT GROUP, 9 King Street, London WC 2E 8HN, U.K.	4, 6
0396	INTERNATIONAL ASSOCIATION OF VOLCANOLOGY AND CHEMISTRY OF THE EARTH'S INTERIOR, Department of Earth Sciences, University of Leeds, Leeds LS2 9JT, U.K.	6, 7
0397	THE INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT, 10 Percy Street, London W1P 0DR, U.K.	3, 4, 6
0398	THE INTERNATIONAL PETROLEUM INDUSTRY ENVIRONMENTAL CONSERVATION ASSOCIATION, Bucklersbury House 4th Floor, Cannon Street, London EC 4N 8EL, U.K.	2, 5, 6
0399	THE INTERNATIONAL PRIMARY ALUMINIUM INSTITUTE, New Zealand House 3th Floor, London SW1Y 4TQ, U.K.	5
0400	INTERNATIONAL TREE CROPS INSTITUTE, Convent Lane, Bocking Braintree, Essex, U.K.	4
0401	INTERNATIONAL UNION OF PURE AND APPLIED CHEMISTRY, Bank Court Chambers, 2-3 Pound Way, Cowley Centre, Oxford, OX4 3YF, U.K.	4
0402	LUCAS AEROSPACE COMBINE SHOP STEWARDS COMMITTEE, 33 Murray Street, Burnley B10 1SB, U.K.	5
0403	NATIONAL SOCIETY FOR CLEAN AIR, 136 North Street, Brighton BN1 1PG, Sussex, U.K.	5
0404	THE NATURAL ENERGY CENTRE, 161 Clarence Street, Kingston, Surrey KT1 1QT, U.K.	4, 6
0405	NEW VILLAGES ASSOCIATION, Food and Energy Research Centre, Evesham Road, Cleve Priory, Evesham, Worcs., U.K.	5
0406	THE NORTH CRAVEN ACTION GROUP, Sutcliffe House, Settle, Yorks. BD24 0BA, U.K.	4
0407	NUCLEAR INFORMATION NETWORK, 29 Great James Street, London WC1N 3ES, U.K.	6
0408	OVERSEAS DEVELOPMENT INSTITUTE, 10-11 Percy Street, London W1P 0JB, U.K.	7
0409	OXFAM, 274 Banbury Road, Oxford OX2 7DZ, U.K.	3, 4, 5, 7
0410	OXTRIKE, Oxford University, Parks Road, Oxford OX1 3PJ, U.K.	6
0411	THE PEOPLES' NEWS SERVICE, 182 Upper Street, London N1, U.K.	5
0412	PRACTICAL SELF SUFFICIENCY, Broadleys Publishing Company, Widdington, Saffron Walden, Essex CB11 3SP, U.K.	3, 4
0413	ROYAL TOWN PLANNING INSTITUTE, 26 Portland Palace, London W1N 4BE, U.K.	6
0414	SKILLS EXCHANGE NETWORK FOR A STABLE ECONOMY, 18 The Forum, Chiden Park, Havant, Hants. PO9 1DR, U.K.	2
0415	SOCIETY FOR CLEAN AIR, Sussex, U.K.	
0416	THE SOCIETY FOR PROMOTION OF NATURE CONSERVATION, The Green, Nettleham, Lincoln, U.K.	3
0417	THE SOIL ASSOCIATION, Walnut Tree Manor, Haughley, Stowmarket, Suffolk IP14 3RS U.K.	1, 4
0418	SOLAR ENERGY DEVELOPMENTS, Bay 10, 16 South Wharf, London W1 1PF, U.K.	4, 6
0419	STUDENT COMMUNITY ACTION RESOURCES PROGRAMME, 109 Oxford Road, GR Books, All Saints, Manchester M13, U.K.	6
0420	THRESHOLD FOUNDATION, 7 Regency Terrace, London SW7 3QW, U.K.	3
0421	THE TRANSPORT AND ENVIRONMENTAL GROUP, Rose Mullion, Holmesdale Road, South Nutfield, Surrey, U.K.	4
0422	UNDERCURRENTS LIMITED, 27 Clerkenwell Close, London EC1R 0AT, U.K.	2
0423	THE WILDLIFE RESEARCH CENTRE, Middle Garland, Chumleigh EX18 7DU, U.K.	3
0424	WORLD ASSOCIATION OF GIRL GUIDES AND GIRL SCOUTS, 132 Ebury Street, London SW1W 9QQ U.K.	7
0425	AIR POLLUTION CONTROL ASSOCIATION, 4400 Fifth Avenue, Pittsburgh, Penn. 15230, U.S.A.	5
0426	ALTERNATIVE SOURCES OF ENERGY, RTA Box 90, Milaca, Minn. 56353, U.S.A.	4, 6
0427	AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, 1776 Massachusetts Avenue NW, Washington DC 20036, U.S.A.	3
0428	AMERICAN LUNG ASSOCIATION OF LOUISIANA, 1740 Broadway, New York, NY 10019, U.S.A.	5
0429	AMITY FOUNDATION, 2760 Riverview, Eugene, Oregon 97403, U.S.A.	2, 3, 4, 6
0430	ANIMAL PROTECTION INSTITUTE, 5894 Southland Park Drive, Box 22505, Sacramento, Ca. 95822, U.S.A.	3
0431	ANIMAL WELFARE INSTITUTE, P.O. Box 3650, Washington DC, 20007, U.S.A.	3
0432	BAHA'I INTERNATIONAL COMMUNITY, 345 East 46th Street, New York, NY 10017, U.S.A.	7
0433	BATTELLE MEMORIAL INSTITUTE, 505 King Avenue, Columbus, Ohio 43201, U.S.A.	1, 6
0434	BIKEWAYS FOR BUFFALO, c/o Joan Smith, 309 Highland Avenue, Buffalo, NY 14222, U.S.A.	4
0435	BUILDERS EXCHANGE OF DETROIT AND MICHIGAN, 1351 E. Jefferson Avenue, Detroit Mich. 48207, U.S.A.	2

0436	CARNEGIE-MELLON UNIVERSITY PROGRAMME IN HUMANITIES AND TECHNOLOGY, Shenley Park, Pittsburgh, Penn.15213, U.S.A.	2
0437	THE CENTER FOR HABITAT AND HUMAN SETTLEMENTS, 77 Vandewater, San Francisco 94133, U.S.A.	2, 6
0438	CENTER FOR INTERNATIONAL ENVIRONMENTAL INFORMATION, 300 East 42nd Street, New York, NY 10017, U.S.A.	6
0439	CHESAPEAKE BAY FOUNDATION, Box 1709 Prince George and East Street, Annapolis, Maryland 21404, U.S.A.	3
0440	COALITION AGAINST OIL POLLUTION, 6701 West Mercer Way, Mercer Island, Washington 98040, U.S.A. (National office)	6
0441	CONCERNED CITIZENS OF TENNESSEE, Dixon Springs, T.N. 37057, U.S.A.	6
0442	THE COUSTEAU SOCIETY, 777 Third Avenue, New York, NY 10017, U.S.A.	3, 6
0443	DEPT. OF CITY AND REGIONAL PLANNING, 190 West 17th Avenue, Columbus, Ohio 43210, U.S.A.	2, 7
0444	THE DEXTREL INSTITUTE OF TECHNOLOGY, 32nd and Chestnut Street, Philadelphia 19104, U.S.A.	4
0445	EARTHQUAKE ENGINEERING RESEARCH INSTITUTE, 2620 Telegraph Avenue, Berkeley, Ca. 94704, U.S.A.	7
0446	ECOLOGY ACTION OF THE MIDPENINSULAR, 2225 El Camino, Palo Alto, Ca.94306, U.S.A.	3, 4
0447	THE ECOLOGY CENTER, 2179, Allston Way, Berkeley, Ca. 94704, U.S.A.	6
0448	ECOLOGY CENTER OF SOUTHERN CALIFORNIA, P.O. Box 24388, Los Angeles, Ca.90024, U.S.A.	6,
0449	ENVIRONMENTAL COALITION ON NUCLEAR POWER (US),	6
0450	ENVIRONMENTAL COORDINATION ORGANISATION, 3555 Hillcrest, Dubuque, Iowa 52001, U.S.A.	6
0451	THE ENVIRONMENTAL STUDIES INSTITUTE, Drexel University, 32nd and Chestnut Street, Philadelphia, U.S.A.	2
0452	THE ENVIRONMENTAL STUDIES SECTION OF THE INTERNATIONAL STUDIES ASSOCIATION, Dept. of Political Science, Western Michigan University, Kalamazoo, Michigan 49001, U.S.A.	4
0453	ENVIRONMENTALISTS FOR FULL EMPLOYMENT, 1101 Vermont Avenue NW, Washington DC 20005, U.S.A.	2, 6
0454	EXPERIMENTAL CITIES INC., P.O. Box 731 Pacific Palisades, CA. 90272, U.S.A.	2,
0455	FRIENDS OF THE EARTH, 124 Spear Street, San Francisco, CA.94105, U.S.A.	1, 2, 3, 6
0456	GENERAL WHALE, 9616 MacArthur Blvd., Oakland, Ca.94605, U.S.A.	3
0457	GREATER PHILADELPHIA BICYCLE COALITION, Box 8194, Philadelphia, PA.19101, U.S.A.	4
0458	GREENING AMERICA'S CITIES, Oakland, U.S.A.	2
0459	GREENPEACE FOUNDATION OF AMERICA, 240 Fort Mason, San Francisco, Ca.94123,U.S.A.	3
0460	I.E. ASSOCIATIES, 3704 11th Avenue, South Minneapolis, Minn. 55407, U.S.A.	2
0461	THE INSTITUTE FOR ENVIRONMENTAL EDUCATION, 8911 Euclid Avenue, Cleveland Ohio 44106, U.S.A.	3
0462	INSTITUTE CN MAN AND SCIENCE, P.O. Box 65, Rensselaerville, NY 12147, U.S.A.	2, 6, 7
0463	INTERMEDIATE TECHNOLOGY, 556 Santa Cruz Avenue, Menlo Park, Ca.54025, U.S.A.	4
0464	INTERNATIONAL WHALE PROTECTION COMMITTEE, Connecticut, U.S.A.	3
0465	INTERTECT, P.O. Box 10502, Dallas, Texas 75207, U.S.A.	7
0466	THE LEAGUE AGAINST NUCLEAR DANGERS, Route 1, Rudolnh, Wis.54475, U.S.A.	6
0467	LORIEN HOUSE, P.O. Box 1112, Black Mountain, NC 28711, U.S.A.	6
0469	NATIONAL ACADEMY OF SCIENCES, 2101 Constitution Avenue NW, Washington DC 20418, U.S.A.	4
0470	NATIONAL AUDUBON SOCIETY, 950 Third Avenue, New York, NY 10022, U.S.A.	1, 3
0471	THE NATIONAL COUNCIL OF CHURCHES, 475 Riverside Drive, Room 572, New York, NY 10027, U.S.A.	4, 5, 6, 2
0472	NATIONAL SANITATION FOUNDATION, 3475 Plymouth Road, Ann Arbor, Mich.48105, U.S.A.	5
0473	NATIONAL WILDLIFE FEDERATION, 1412 16th Street NW, Washington DC 20036, U.S.A.	6
0474	NATURAL HAZARDS RESEARCH AND APPLICATIONS INFORMATION CENTER, Institute of Behavioral Science No.6, University of Colorado, Boulder, Col.80309, U.S.A.	7
0475	NATURAL RESOURCES DEFENCE COUNCIL, 917 15th Street, NW, Washington DC 20005, U.S.A.	3, 5, 6
0476	THE NEW ALCHEMY INSTITUTE, P.O. Box 432, Woodshole, Mass. 02543, U.S.A.	2
0477	NEW YORK OCEAN SCIENCE LABORATORY, Montauk, New York 11954, U.S.A.	3, 4, 5
0478	THE OCEANIC INSTITUTE, Waimanalo, Hawaii 96795, U.S.A.	3
0479	OREGON ENVIRONMENTAL COUNCIL, 2637 SW Walter Avenue, Portland, Oregon 97201, U.S.A.	2
0480	THE PACIFIC SCIENCE ASSOCIATION, Box 17801, Honolulu, Hawaii 96817, U.S.A.	4

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0481 THE PEOPLE'S ENERGY PROJECT, P.O. Box 423, Lawrence, Kansas 66044, U.S.A.	6
0482 PROJECT JONAH, P.O. Box 476, Bolinas, Ca.94924, U.S.A.	3
0483 PUBLIC INTEREST RESEARCH GROUP, 590 Hollister Building, Lansing, Mich.48933, U.S.A.	6
0484 RESOURCES FOR THE FUTURE, 1755 Massachusetts Avenue, NW, Washington DC 20036, U.S.A.	2, 4
0485 SIERRA CLUB, 800 2nd Avenue, New York, NY 10017, U.S.A.	6
0486 SIERRA CLUB INTL., 311 California Street, Suite 311, San Francisco, Ca.94104, U.S.A.	3, 6
0487 THE STANLEY FOUNDATION, Stanley Building, Muscatine, Iowa 52761, U.S.A.	1
0488 TOLEDO UNIVERSITY, 2801 W. Bancroft, Toledo, Ohio 43606, U.S.A.	6
0489 TRANSNATIONAL NETWORK FOR APPROPRIATE AND ALTERNATIVE TECHNOLOGIES (TRANET), Box 567, Rangley, Maine 04970, U.S.A.	4
0490 TRANSPORTATION ALTERNATIVES, 20 Exchange, Pl Rm 5500, New York, NY 10005, U.S.A.	4
0491 TRUST FOR PUBLIC LAND, 82 2nd Street, San Francisco, Cal.94105, U.S.A.	3
0492 URBAN AND LAND INSTITUTE, 1200 18th Street NW, Washington DC 20036, U.S.A.	3
0493 VITA, 3706 Rhode Island Avenue, Mount Rainier, Maryland 20822, U.S.A.	2, 4
0494 WATER POLLUTION CONTROL FEDERATION, 2626 Pennsylvania Avenue NW, Washington DC U.S.A.	5
0495 THE WILDLIFE MANAGEMENT INSTITUTE, 709 Wire Building 1000 Vermont Avenue NW, Washington DC 20005, U.S.A.	3, 6
0496 WORLDWATCH INSTITUTE, 1776 Massachusetts Avenue NW, Washington DC 20035, U.S.A.	1
0497 THE AFRICAN SOCIETY FOR DEVELOPMENT STUDIES (Societe d'etudes et de developpement), B.P. 593, Ouagadougou, Upper Volta.	3, 4
0498 CENTRE FOR ECONOMIC AND SOCIAL STUDIES OF WEST AFRICA, B.P. 305, Bobo-Dioulasso, Upper Volta.	3
0499 THE INTER-STATE ORGANISATION FOR ADVANCED TECHNICIANS OF HYDRAULICS AND RURAL EQUIPMENT (Inter-etats des techniciens superieurs de l'hvdraulique etude et d'equipement rural), B.P. 594, Ouagadougou, Upper Volta.	4, 6
0500 THE RESEARCH AND APPLIED TECHNIQUES SERVICE, P.O. Box 593, Ouagadougou, Upper Volta.	4
0501 URUGUAYAN INSTITUTE FOR THE PRESERVATION OF THE HUMAN ENVIRONMENT (Instituto Uruguayo para la preservacion del medio humano), 18 de julio 1516, Piso 9, Esc.7, Montevideo, Uruguay.	5, 6
0502 LA SALLE NATURAL SCIENCE SOCIETY (Fundacion la salle de ciencias naturales), Apartado postal 8150, Caracas 101, Venezuela.	3
0503 THE WORLD ASSOCIATION FOR RURAL HOUSING (Asociacion mundial de vivienda rural), Apartado 16224, Caracas, Zona 101, Venezuela.	2
0504 URBAN PLANNING INSTITUTE OF THE SOCIALIST REPUBLIC OF SLOVENIA, Jamoya 18, Ljubljana 61111, Yugoslavia.	2, 7
0505 THE BIOLOGY DEPARTMENT OF THE UNIVERSITY OF ZAMBIA, P.O. Box 2379, Lusaka, Zambia.	3, 6, 7
0506 THE NATIONAL COUNCIL FOR SCIENTIFIC RESEARCH, P.O. Box 158, Chelston, Lusaka, Zambia.	3
0507 THE UNIT OF LAND USE TRAINING, Dept. of Biology, University of Zambia, P.O. Box 2379, Lusaka, Zambia.	4
0508 NORD NATURE FEDERATION (Federation Nord-Nature), U.S.T.L., B.P. 36, Villeneuve d'Ascq, France 59650.	6
0509 NEW ZEALAND BRANCH OF CLEAN AIR SOCIETY, P.O. Box 27116, Wellington, New Zealand 3571.	6
0510 ENERGY PROBE, Ottawa, Canada. (Contact through: Energy Probe, c/o Ecology House, 12 Madison Avenue, Toronto, Ontario, Canada.)	6
0511 COMMUNITY PLANNING ASSOCIATION OF CANADA, Ottawa, Canada. (Contact through: New Brunswick Division, Box 6501, Saint John, N.B., Canada E2L 4R9.)	6
0512 SOCIETY TO OVERCOME POLLUTION (Societe pour Vaincre la Pollution), C.P. 65, Place d'Armes, Montreal, Quebec, Canada.	6
0513 NEW ALCHEMY INSTITUTE, P.O. Box 432, Woodshole, Mass. 02543, U.S.A. (Contact for establishment on Prince Edward Island, Canada.)	2
0514 CANADIAN COALITION FOR NUCLEAR RESPONSIBILITY, 2010 Mackay Street, Montreal, Canada.	6
0515 GREENPEACE FOUNDATION, Ontario, Canada. (No current address)	3
0516 CONSUMERS ASSOCIATION OF CANADA, 251 Laurier Avenue West, Suite 801, Ottawa, Ontario K1P 577, Canada.	6
0517 POLLUTION PROBE, 53 Queen Street, Suite 54, Ottawa K1P 5C5, Canada.	4

