THE PUBLIC AND ENVIRONMENT

THE STATE OF THE ENVIRONMENT

1988

United Nations Environment Programme

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PREFACE

One of the main functions assigned to the Governing Council of the United Nations Environment Programme by the General Assembly in resolution 2997 (XXVII) of 15 December 1972 is:

> *"To keep under review the world environmental situation in order to ensure that emerging environmental problems of wide international significance receive appropriate and adequate consideration by Governments."*

Accordingly, the United Nations Environment Programme issues each year a report on the state of the environment. Annual state of the environment reports published since 1974 dealt with a broad spectrum of environmental issues. In 1982, the United Nations Environment Programme issued a comprehensive report on the state of the world environment, which covered the period 1972-1982 and dealt with the different changes that occurred in the environment in the decade that followed the 1972 Stockholm Conference. In 1983, 1984 and 1985, the annual state of the environment reports discussed, again, some selected topics.

*At its thirteenth session, the Governing Council of UNEP decided that the annual state of the environment reports should alternate in successive years between a report dealing with a specific selected issue related to the economic and social aspects of the environment and a report on the state of the world environment based, **inter alia**, on the data and results of assessments available through the Global Environmental Monitoring System (decision 13/9 D). Accordingly, the 1986 state of the environment report dealt with the issue of environment and health, as decided upon by the Governing Council and the 1987 report dealt with the state of the world environment focusing on the changes that have taken place in the environment in the period 1981-1986, thereby covering the five years after the first world report, published in 1982.*

The present report deals with the topic of the public and environment, with special emphasis on the role of women, in accordance with Governing Council decision 14/9 B, paragraph 6. The "public" is here taken to mean the populace at large, male and female, as distinct from the organizational structure of government. It includes parliamentarians and other representatives of the people, religious leaders, the media, non-governmental organizations, and industrialists (outside the state sector). It includes rather more women than men. In this respect, I must emphasize that it has never been our intention to isolate women as somehow separate. However, since women play a central part in environmental management and in promoting sustainable development—an essential contribution commonly taken for granted—their role warrants special consideration in a separate section of this report.

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Nairobi, August 1988

EXECUTIVE SUMMARY

There has always been a profound interaction between people and their environment. Changes in the relationship between people and their physical environment depend to a large degree in change in society. During ancient times, people learned that their actions could damage the natural resources by which they lived. The destruction of natural areas stimulated the formation and growth of a conservation movement in the earlier part of this century. But since the late 1960s, environmentalism has become a movement with widespread popular support and a much broader scope of interest. The environmental movement turned from looking at the natural environment per se towards its interrelationship with the human situation, and emphasized the relationship between man-made and natural environments and between poverty and environmental degradation.

Interactions between scientists, citizen groups and other non-governmental organizations, and the media, created an increasing public awareness of environmental issues. Since the 1970s, the size, commitment and dedication of the many non-governmental groups and organizations which make up the environmental movement have made a significant impact in many countries. The environment is becoming an ever more popular issue. Perceptions and attitudes are changing, and the changes are proving remarkably widespread and robust.

Public perceptions and attitudes towards environmental issues have been conditioned by cultural, traditional, socio-economic and political factors. Efforts to change perceptions and attitudes must be tailored to sociological and geopolitical conditions and must take into account the interests of the public and ensure their acceptance and participation. Opinion surveys carried out in several countries showed consistent public concern about environmental problems; the nature of the problems varied widely from one country to another and even from one place to another in the same country. Very often the public's perception of environmental hazards varies from that of the experts and decision makers. The latter should, therefore, understand how people think about and respond to risk. Without such understanding, well-intended decisions and policies may become ineffective. The public should be encouraged to become fully involved in planning and decision-making through participation so that more durable policies will emerge.

Public participation tries to ensure that due consideration will be given to public values, concerns, and preferences when decisions are made. Public participation in planning, in decision-making and in management is indispensable for achieving the integration of economic, social and environmental objectives. Such participation provides a safeguard against poorly-considered decisions, and a useful means of increasing public awareness of environmental protection and conservation of natural resources and of increasing the awareness of decision-makers of public concerns. Participation tends to build public confidence and improve the public's understanding of management objectives and it provides additional data for planners and policy makers.

Women appear to be more concerned than men about the state of the Earth and the fate of future generations. This is natural because women are often the first to suffer from environmental deterioration and underdevelopment. In addition to their role as important environmental educators for their children, women can stimulate changes in behaviour in the family, leading to efficient use and conservation of water, energy, food and other resources, and at the same time achieve a better standard of living. At home, in the field, office or factory, women are exposed to different environmental pollutants. Their awareness of the different hazards involved will undoubtedly reduce the risks involved not only on them but also on their

children. Effective participation of women in rural development could lead to considerable improvement of the quality of life in such areas.

Mass communication in its different forms is indispensable for increasing public awareness of different environmental issues. The medium (or media) used most frequently varies from one country to another and depends on education and socio-economic levels. In spite of the fact that media coverage of environmental issues has gained momentum since the early 1970s in virtually all countries, environmental issues still remain of relatively marginal concern in most newspapers and television news and current affairs programme. Trigger events, either disasters or threatened disasters receive wide coverage by the media. Because news is about the unusual, the media generally emphasize hazards that are relatively serious and/or relatively rare. This natural predisposition towards the dramatic ensures that the information provided by the media about risks is frequently inadequate. The media are superb at evoking the serious outcome associated with a particular instance of a hazard, but they generally do not put such risks in perspective. And in most cases, there is no follow-up and in-depth treatment of long-term consequences of an event that had occurred. Although coverage of environmental issues by the media, particularly the print media, has become increasingly sophisticated and knowledgeable over the past decade, public trust in different media still varies greatly. Improving the availability of environmental information to the media through more and better interaction with scientists and experts and better training of media personnel, and their proper reporting of such information to the public, is critical for the management of environmental problems. One of the most important roles of the media is to expand the audience for debate on a particular issue. This frequently results in new thinking to include new dimensions that emerged from the debate of a wider audience. This usually leads in the end to better, more enduring policies.

I. INTRODUCTION

I. INTRODUCTION

1. The environment—defined as the total outer physical and biological system within which human beings and other organisms live—is a whole, albeit a complicated, system with many interacting components. Human beings, in their quest for survival and development, have caused immense environmental change. In many places, the aim has been to increase the output of food, fibre, fuel or other products useful to humanity, and the changes have been crucial to the growth in human population and to the enhancement of its security and quality of life. But human activities have also caused widespread environmental deterioration manifested by soil erosion, loss of cropland, pollution, deforestation, extinction of species, etc. This has, in turn, degraded the quality of life of many millions of people, and threatened the very future of humanity through climatic change, desertification, deterioration of water supplies, and the disruption of the biological diversity.

2. Many policy makers now realize that unless development is guided by environmental, social, cultural and ethical considerations, much of it will continue to have undesired effects, to provide reduced benefits or even to fail altogether. Such "unsustainable" development will only exacerbate the environmental problems that already exist. We all must come to terms with the reality of resource limitations and the carrying capacities of ecosystems. We must pursue plans that would not lead to conflicts over such limited resources and that would lead to "sustainable" development—meeting the needs of the present without compromising the ability of future generations to satisfy theirs (1).

3. To achieve these goals, development plans in both developed and developing countries should be managed to maintain or improve the resource and environmental base on which they depend to allow future generations to live equally well as ourselves or better. Sustainable development does not require the preservation of the current stock of natural resources or any particular mix of human, physical and natural assets. Nor does it place artificial limits on economic growth, provided that such growth is both economically and environmentally sustainable.

4. The goal of sustainable development cannot be attained without significant changes in the ways development initiatives have been planned and implemented. These changes will not come about unless there are similar changes in the public's perceptions of environmental issues and its attitudes towards them. They will not come about if we do not consider environmental protection and environmental security as essential parts of national and international security. Environmentally sound development plans will not succeed without public participation and sense of individual responsibility. As the sixteenth principle of the World Charter for Nature, adopted by the General Assembly of the United Nations on 28 October 1982, states:

> "All planning shall include, among its essential elements, the formulation of strategies for the conservation of nature, the establishment of inventories of ecosystems and assessments of the effects on nature of proposed policies and activities; all of these elements shall be disclosed to the public by appropriate means in time to permit effective consultation and participation."

If the public is well-informed about environmental issues through the media, properly consulted, and encouraged to participate in decision-making, it is likely to accept the need for change quickly—and, in doing so, support the action of Governments or force them to act. Women have a particularly important role to play in this process in both developed and developing countries. Often the first to suffer from unsustainable development and environmental degradation, frequently the first to campaign for change, women are at the leading edge of the struggle for development in harmony with the environment.

II. ENVIRONMENTAL AWARENESS

Roots of the Environmental Movement
Modern Environmentalism
Environmental Groups

II. ENVIRONMENTAL AWARENESS

Roots of the Environmental Movement

5. Both the creation and the recognition of environmental problems and opportunities depend on society, its organization, its values and objectives. Changes in the relationship between people and their physical environment depend to a large degree on changes in society.

6. There has always been a profound interaction between people and their environment. Early human beings lived by hunting and gathering. They greatly modified many areas of the Earth and caused the extermination of several animal species. About 10,000 years ago, in various parts of the world, humans started to cultivate food plants rather than merely gather them, and to keep animals rather than just hunt them, beginning the establishment of agricultural communities and exchanging the uncertainties and hardships of hunting and wandering for the routines of settlement. Settled peoples developed skills in pottery, in building and, perhaps especially, in the mining of ores and the smelting of metals. Historical records indicate that such activities took place some 7,000 years ago in Egypt, Iran and Thailand, and greately increased human power.

7. During those early times, people learned that their actions could damage the natural resources by which they lived. Tree cutting, overgrazing and soil erosion were destructive forces in the Mediterranean area from Syria to Spain, in southern and central China, in India and in Central America. Civilizations that once flourished in these areas disappeared because agricultural productivity declined, in spite of the development of some conservation practices. Historical records indicate that some species of animals were protected by religious taboos; religious sanctions prevented the destruction of some forest groves and plants; and practices to prevent soil erosion and to maintain its fertility were developed (for example, the use of organic fertilizer). Some of the early civilizations created reserves to protect wildlife or natural areas (2).

8. Ancient Greek and Roman scholars wrote about soil husbandry and land management. Plato, in *Critias,* described deforestation and soil erosion as the negative side of power (3). In *The Laws,* he wrote what can be considered as the earliest known enunciation of what we now describe as the "polluter-pays" principle:

> "Water is easily polluted by the use of any kind of drug. It therefore needs the protection of a law, as follows: whoever purposely contaminates water shall be obliged in addition to paying an indemnity, to purify the spring or receptacle of the water, using whatever method of purification is prescribed." (*The Laws,* Book VIII, 845)

9. In the later Middle Ages, we notice Bacon's advocacy of the use of scientific knowledge to gain mastery over "Nature", and Descartes' aspiration to the development of "a practical philosophy ... whereby we can render ourselves the masters and possessors of Nature" (4).

10. By the seventeenth century, Europeans had developed an increasingly powerful technology and a growing ability to modify large areas of the environment. As explorers and colonialists, they concentrated on transplanting their own cultures to the lands they visited and settled and showed little interest in learning from the indigenous peoples—who had in

many places developed sophisticated methods of managing their own environments. Soil erosion and the destruction of natural vegetation and wildlife accompanied the spread of European colonization in the Americas and later in Asia, Australia, and Africa. The wholesale massacre of the North American bison—the mainstay of an indigenous and sustainable hunting culture—to make room for crops and imported domestic cattle is just one example of the kind of destructive interaction that became commonplace.

11. The greatest expansion of human requirements for natural resources followed the Industrial Revolution during the latter half of the eighteenth and first half of the nineteenth centuries and the scientific and technological revolutions that followed in the twentieth century. The environmental students of the nineteenth century expressed concern about the impacts of human transformation of the landscape and early geographers and geologists attempted to describe the changing face of the earth in its entirety. For example, in 1800, Alexander von Humboldt pointed out that deforestation, the clearing of plains, and the cultivation of indigo were the main causes of the gradual decrease in the level of Lake Valencia in Venezuela. In 1864, George Perkins Marsh published *Man and Nature,* which is probably the most important landmark in the history of the study of the role of humans in changing the face of the Earth. Between 1876 and 1894, E. Reclus completed the great *Nouvelle géographie universelle* which synthesized available knowledge about the planet's surface in 13 volumes (5, 6).

12. Such global and regional perspectives were by no means the first environmental protests. The first smoke abatement law was passed in England in 1273, for example (7). Cities passed many ordinances against refuse dumping in streets and canals. Such laws proved ineffective, because the people did not observe them. By the mid-nineteenth century, water pollution was a serious health problem in Europe and elsewhere—particularly in densely populated areas—but measures to abate it were too slow. The nineteenth century environmental writings found favour in literary and educational circles but had almost no immediate effect on public action. In the Europe of the time, industrial growth—generating new wealth and power and forming a basis for colonial expansion—was given priority, with the consent, if not the support, of most of the people.

13. However, there were exceptions. The destruction of natural areas stimulated the formation and growth of a "conservation movement". As early as the 1830s, George Catlin first proposed the idea of national parks in the United States of America in which indigenous lifestyles and wild country could both be preserved, while William Bartram and John James Audubon were arousing an interest in wildlife and its conservation. In 1855, Chief Seattle, writing to the President of the United States, paid eloquent testimony to the sacredness of the Earth to his people, and voiced their concern about the destructiveness of imported European technologies. But it was not until 1864 that the first national park was established, in the Yosemite Valley in California, followed by another, eight years later, in the Yellowstone region of Wyoming. The conservation movement blossomed vigorously at the turn of the century. Early conservationists (including United States President Theodore Roosevelt) started work in defence of natural reserves, ancient buildings and different habitats. The Sierra Club was established in the United States in 1892, followed by the National Audubon Society, the Wilderness Society and others. In the United Kingdom, the Royal Society for the Protection of Birds was founded in 1889. In the Netherlands, three of the eight organizations that comprise the Landelijk Milieu Overleg were founded between 1899 and 1911, as were a number of still-vigorous organizations in France, Sweden, Switzerland, and the Federal Republic of Germany (8).

Modern Environmentalism

14. Technological advance in the first half of the twentieth century raised fundamental questions about the future capacity of the globe to support its rapidly growing population—and about the appropriateness of technology itself. These questions were first debated in scientific circles, but soon caught the attention of the public. In the 1950s, air pollution episodes in Belgium, the United States and the United Kingdom, the incidence of Minamata disease in Japan, the reduction in aquatic life in some Scandinavian and North American lakes as a result of acidification, the death of birds caused by side-effects of pesticides, and incidents of marine oil pollution, all stimulated wide public interest. Scientific and technical understanding of environmental issues steadily increased in the 1960s, public concern about them grew—at least among the better educated people in developed countries—and they began to appear on the political agenda. The publication in 1962 of Rachel Carson's seminal work *Silent Spring* (9) aroused wide interest in the environmental impact of pesticides and technology in general. The increasing public concern, interacting with the moral and social impacts of the Viet Nam war and other stresses in the social fabric, gave birth to the modern environmental movement in the United States. Public pressure led to the National Environmental Policy Act of 1969, requiring environmental analysis in technological and political decision-making. The public campaign in the United States at that time peaked during the Earth Week in April 1970. Everyone seemed to be aroused to the environmental danger and eager to do something about it. Meanwhile, public interest in environmental matters was also gathering momentum in Canada, Europe, Japan and some developing countries like India, if not as strongly as in the United States.

15. During the 1970s, environmental issues became established as a permanent feature of national and international policy, and environmental perceptions broadened enormously. The United Nations Conference on the Human Environment, proposed by Sweden in 1968 and convened in Stockholm in 1972, was the single most important turning point in the history of the growth of environmental awareness. It came about because growing public pressure, backed by scientific findings in the late 1960s and early 1970s, stimulated the necessary political will, at least in developed countries. Developing countries were initially suspicious, but the Stockholm Conference itself and meetings at Founex, Switzerland, in 1971, and at Cocoyoc, Mexico, in 1974 met their concerns by paying close attention to the environmental problems caused by lack of development (1). A new consensus was forged, and the foundations of the concept of sustainable development were laid. In 1972 also, *The Limits to Growth,* the first report of the Club of Rome (10), called attention to resource constraints, and, although many of its projections and assumptions came under detailed criticism, it added another strand to the concept of sustainability. Finally, the Action Plan for the Human Environment adopted by the Stockholm Conference, the establishment of the United Nations Environment Programme in the same year, and the enthusiasm of non-governmental organizations, both at the Conference and afterwards, gave further impetus to the environmental movement and gave it effective expression in the international community.

16. Thus, while in the earlier part of this century environmentalism was essentially synonymous with wildlife conservation, and the domain of a prescient and often privileged few, it has, since the late 1960s, become a movement with widespread popular support and a much broader scope of interest. The environmental movement has become concerned with all aspects of the natural environment: land, water, minerals, all living organisms and life processes, the atmosphere and climate, the polar icecaps and remote ocean deeps, and even outer space. It turned from looking at the natural environment *per se* towards its

interrelationship with the human situation, at the level both of whole communities and of individual needs for housing and living, and emphasized the relationship between man-made and natural environments and between poverty and environmental degradation.

17. Some predicted that environmentalism would pass through an "issue attention cycle" in which it would leap into prominence, remain there for a short time, and then gradually fade from public attention as economic recession, developing country debt and regional conflicts grew (11). Yet, environmentalism has not only survived into the 1980s but has appropriately altered its complexion to suit the requirements of the times.

18. During the 1970s, the approach to environmental problems shifted from a nascent to a mature stage. Public reaction helped to change established political and economic attitudes and practices in several important ways. Modifications to social cost-benefit analysis, the onset of environmental impact assessment and environmental auditing, risk analysis, public inquiries, new legislative measures at national and international level, plus the successful political-legal activities of non-governmental groups have all helped to give policies and actions a more environmental tenor.

19. Recent years have seen the development of another phase of the environmental movement. This is characterized by the concern evinced, and organization taking place, on a national and international scale, around some important, complex, and widespread problems. Examples are acid rain, the disposal of hazardous wastes, desertification, the destruction of tropical rain forests, and the interaction between peace, security and environment. Effective environmental action on these issues requires a wide range of skills: considerable academic knowledge on the part of those actively involved, organizational ability to effect activities in the often widely separated areas where the issue surfaces; political skill to deal with the Governments, industries, special interest groups, and individuals who all play major roles in such issues; an ability to communicate to, and through, the media; and, perhaps most important of all, a long-term concern and willingness to face the "big" issues. All these are characteristics of emerging environmentalist professionalism (12). They involve co-ordination of the efforts of many different issues through the realization of a common concern for the present and future state of the environment and the needs of present and future generations.

20. Meanwhile environmentalism and environmentalists have increasingly entered the political arena. This implies two important changes: a considerable degree of organization (i.e., a political machine) and a reasoned and coherent political platform that integrates traditional environmental concerns, such as the protection of nature and prevention of pollution, with the many other international, social, and economic issues that are an essential part of politics. In some countries—such as the Federal Republic of Germany, Sweden, the Netherlands and, recently, Chile—"green" or ecology political parties have emerged in recent years (13); in others, environmentalists have emerged within existing parties (14).

21. The next stage of the movement may be to place further emphasis on the poor and special groups in the society, e.g. women and children, who experience the most severe environmental problems first hand. It has been argued that present environmental initiatives suffer from a common flaw, in that they place too much emphasis on the values of developed nations and of *élites* in developing countries. Environmentalists have generally yet to work out how to enable the people most affected to participate fully in choosing solutions to their problems. The new approach of the 1980s—manifest in the World Conservation Strategy launched in 1980, the 1985 Cairo Programme for African Co-operation of the African Ministerial Conference on the Environment, and the recom-

mendations made by the World Commission on Environment and Development in 1987—has been to restore people, including indigenous and local communities, to a central place when environmental needs are considered.

Environmental Groups

22. Scientific groups and non-governmental organizations (NGOs) have played a major role in the environmental movement from its start. Scientists have served society by their contribution to the development of agriculture, forestry, public health and other measures that have improved the human condition. They were also among the first to point out evidence of significant environmental risks and changes resulting from the growing intensity of human activities. Interactions between scientists, citizen groups and other NGOs, and the media, created an increasing public awareness of environmental issues. This, in turn, created political pressures that stimulated Governments to act.

23. There are many types of environmental groups. Small ones are organized locally to fight local problems, often environmental disruption—immediate or potential—from pollution or some apparently inappropriate form of development. Others deal with a special issue, but on a national scale. There are many examples in developed and developing countries. Some now enjoy great public credibility. Groups objecting to the construction of nuclear facilities in their neighbourhoods or countries have been active in the United States of America, the United Kingdom, the Federal Republic of Germany, Austria, Sweden, and other countries. In India, the Kerala-based People's Science Organization (KSSP) blocked a hydroelectric project in the Silent Valley, one of India's few remaining rain forests (15). The *Mitti Bachao Abhiyan* in Central India raised questions about the ecological and economic usefulness of canal irrigation in raising food production (16). Relief efforts after the 1984 Bhopal tragedy engaged the talents and resources of a wide variety of non-governmental groups, among them KSSP, the Delhi Science Forum, the Medico Friend Circle, and the Lawyers' Collective. A by-product of citizen activism in Bhopal is a new appreciation among those groups of the need to combine technical, political, and legal strategies in fighting for a cleaner and safer environment. In India, there are more than 350 NGOs working in the environmental field.

24. Other national NGOs are primarily concerned with the use of the environment and who should benefit from it. Some have been described as "sustainable development" or "appropriate technology" groups. Women have played a particularly important part in many of them. The Chipko Movement in India, is one important example. Historically, philosophically and organizationally, it is an extension of traditional Gandhian non-violent protests that took place to protest against villagers being denied access to the forests and their products, under the Forest Acts imposed by the British in 1878 and 1927. The link was provided by two remarkable women, Gandhi's close European associates, Mire and Sarala Behn. They made a major contribution to the growth of ecological consciousness and to raising the status of women in the hills of Uttah Pradesh, and generated a new brand of Gandhian activists. Throughout the 1970s, local people—largely, but not exclusively, women—stopped the felling of their forests by outside contractors, often by hugging the trees ("chipko" means "to embrace"). Chipko's demand that the Himalayan forests should be declared protected forests was recognized at the highest level: Mrs. Indira Gandhi recommended a 15-year ban on commercial green felling in such Himalayan forests in Uttah Pradesh. Unlike the original protests against the Forest Act, Chipko has an ecological base: it arose from alarming signals of rapid ecological destabilization when water sources dried up, landslides increased and food production fell as the trees were cut down, and it has

evolved into a demand for ecological rehabilitation. The Movement insists that producing "soil, water and oxygen" rather than timber or resin is the main purpose of the forests. But it has shown that, under proper popular control, they can also provide fuel, fodder, small timber and fertilizer for local people while being preserved (17).

25. The Green Belt Movement was set up by the National Council of Women of Kenya in 1977. Identifying forest losses as among the most serious causes of soil erosion and land degradation in the country, it helps communities to set up "green belts" of at least 1,000 trees each. There are now more than 1,000 green belts and some 20,000 "mini-green belts" in farmers' fields and about 65 community tree nurseries run by women's groups (18). There are similar movements in a number of countries, such as Mexico, Sri Lanka, Indonesia, and the Philippines, all supported by people struggling for their livelihoods and linked to sustainable objectives.

26. In developed countries, women have often been the first to lead protests against air and water pollution, the dumping of wastes and the establishment of some industrial installations in their neighbourhood. For example, in Sweden more women than men are against nuclear power (19). Women in the United States, Federal Republic of Germany and other countries have participated actively in campaigns against nuclear power, the dumping of hazardous wastes and the use of some chemicals. Women have also played an important role in environmental education and in increasing public awareness of different environmental issues. Actresses, writers, politicians and scientists have led campaigns for wildlife conservation and environmental protection.

27. Many countries have influential broad-interest NGOs, which campaign on many separate environmental issues, as well as single-issue groups. Among the better known are the Natural Resources Defense Council and Environmental Defense Fund in the United States, Sahabat Alam in Malaysia, Grupo de los Cien in Mexico, Bund in the Federal Republic of Germany, Italia Nostra, and the Danish Nature Protection Society. During the 1970s and 1980s, there has been increasing co-ordination among national NGOs (in some cases even the merging of NGOs or the creation of coalitions, such as Wildlife Link in the United Kingdom to tackle important national problems.

28. There is similar co-operation across international boundaries to deal with regional or global issues. This may be said to have begun in 1948 with the foundation of the International Union for the Protection of Nature (later the International Union for Conservation of Nature and Natural Resources (IUCN)), which is unique in having a membership comprising over 60 Governments, 130 government agencies and 350 national and international NGOs. Several NGOs, such as Friends of the Earth, Greenpeace, and World Wide Fund for Nature (WWF) comprise many national affiliates. The Nuclear Free Pacific Movement has been an umbrella under which many groups have met and taken steps to halt nuclear activities in the Pacific (20). Their activities were instrumental in accelerating the conclusion in November 1986 of the Convention on the Protection of the Natural Resources and Environment of the South Pacific Region within the framework of the UNEP regional seas programme: the parties to the Convention agreed to prohibit the dumping or disposal of radioactive wastes in or under the ocean, as part of a wide-ranging agreement to protect the environment of the region. The European Environmental Bureau (EEB) brings together NGOs from all over the European Economic Community (EEC) to work with the European Commission and member Governments, while the recently established African NGOs Environment Network (ANEN) co-ordinates the activities of African NGOs in environmental protection and conservation of natural resources in the wake of the first session of the African Ministerial Conference on the Environment, held in Cairo in December 1985. A global network for information exchange and joint action is provided

through the Environment Liaison Centre (ELC), based in Nairobi, which has over 230 member NGOs and is in contact with about 7,000 more. There is also a welcome and increasing tendency for environmental NGOs to work and campaign with NGOs primarily concerned with development issues and vice versa. Meanwhile, the work of several non-governmental international and regional scientific institutions has provided valuable intellectual and practical underpinning to the work of NGOs and Governments alike.

29. In parallel with—and linked to—the great expansion of the NGO movement since the 1960s, there has been a marked increase in the number of governmental institutions established to deal with environmental issues. Today, nearly all countries have environmental machinery of some kind. At the regional level, interest in environmental issues has culminated in joint action in many areas. Intergovernmental organizations (bilateral or multilateral) have been established to deal with specific problems. Intergovernmental organizations like the Organisation for Economic Co-operation and Development (OECD), the Council for Mutual Economic Assistance (CMEA), the European Communities, the Association of South East Asian Nations (ASEAN), the Gulf Co-operation Council, the Arab League, and others have established special offices or units to tackle environmental issues. A number of development banks have divisions, units or advisers. At the international level, several activities have been undertaken by different United Nations bodies especially since the 1970s. The Global Atmospheric Research Programme (a joint effort between WMO and ICSU), the World Climate Programme, the various projects of the ICSU Scientific Committee on Problems of the Environment (SCOPE), the Unesco Man and the Biosphere programme (MAB), and several projects by FAO, WHO, IAEA and other United Nations bodies are examples of these activities. The establishment of UNEP in 1972 marked the significant commitment of the world community to the environmental cause. Since its establishment, UNEP has worked to co-ordinate the activities of the United Nations as a whole and rendered support to many national and international organizations. For example, UNEP has been supporting and working together with institutions like IUCN, the International Institute for Environment and Development, the World Resources Institute, regional intergovernmental bodies and others. UNEP has also acted as an important catalyst in bringing together different groups to discuss environmental issues and develop plans of action and promote international conventions. The Stockholm Conference itself led to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, and UNEP has brought about plans of action and international conventions for regional seas, the 1985 Vienna Convention for the Protection of the Ozone Layer and the widely acclaimed 1987 Montreal Protocol on the Substances that Deplete the Ozone Layer. UNEP co-operated with IUCN and WWF in formulating the World Conservation Strategy launched in 1980, and has convened, in partnership with other bodies, international conferences like the 1984 World Industry Conference on Environmental Management, the 1984 Inter-Parliamentary Union Conference on Environment, the 1985 Global Meeting on Environment and Development for NGOs, the African Ministerial Conference on Environment, which met in 1985 and 1987, and others. UNEP has also worked closely with the World Commission on Environment and Development and supported the recommendations of the Commission as outlined in its report *Our Common Future,* published in 1987 (21).

30. Since the 1970s, the size, commitment and dedication of the many non-governmental groups and organizations that make up the environmental movement have made a significant impact in many countries. But today the environmental movement is so diverse that a question arises as to whether it is really proper to give it a single name. Environmental organizations and their members often differ in their concern over particular environmental issues, in the values and attitudes advocated, in the goals and objectives to be achieved, and in the types of strategies and tactics. Yet what is shared by all these organizations is a

concern about socio-environmental relationships. UNEP has responded to such diversification by its "outreach" policy of opening up a dialogue with industry, parliamentarian, relief, women, youth, religious and other groups that are receptive to the environmental message. This message is being accepted and adopted by more and more sections of society, and by more and more of the people, in both developed and developing countries. The environment is still becoming an ever more popular issue. Perceptions and attitudes are changing, and the changes are proving remarkably widespread and robust.

III. PERCEPTIONS AND ATTITUDES

III. PERCEPTIONS AND ATTITUDES

31. Public perceptions and attitudes towards environmental issues have been conditioned by cultural, traditional, socio-economic and political factors. Historical records show they varied widely from one civilization to another. Some lasted only as long as a particular epoch of civilization, others underwent changes and lasted for successive civilizations. Perhaps one of the most significant value concepts that has been cherished from ancient times is *mottainai* in Japan. It suggests that everything in the world is a gift from the Creator, and that people should be grateful for it; to waste anything is considered a sin (22). This has greatly affected Japanese attitudes and stimulated a marked sense of rational use of different resources. For example, between 1973 and 1984, Japan led the world in energy conservation, with a remarkable 29 per cent decline in its energy/GNP ratio, as compared to only 16 per cent in Western Europe (23). Traditional values, perceptions and attitudes towards the environment cannot be easily changed. Increasing public awareness, education, and economic incentives and disincentives are among the various factors that could lead to an effective change, but this is a lengthy and complex process. Efforts to change perceptions and attitudes must be tailored to sociological and geopolitical conditions and must take into account the interests of the public and ensure their acceptance and participation.

32. Since the 1960s, perceptions and attitudes towards environmental issues have changed considerably. Students of modern environmentalism (4, 24, 25) have identified three types of perceptions. In the first, environmentalism is characterized by an emphasis on the need for strong environmental legislation and technological solutions (e.g. recycling), and by the idea that reforms to the system can be produced by idealism, determination, goodwill, and the efforts of individuals, local groups and committees. In the second, environmentalism is characterized by the realization that in modern society "things are not that simple". There has been consequently a growth in the formation of pressure groups whose aim has been to influence the decision-making process. The third type of environmentalism, as now perceived by some groups, is characterized by the development of a critique of the technological and energetic basis of present society and calls for the development of alternative or "soft" technologies and increased self-reliance.

33. Another categorization of perceptions is the use of the terms "technocentrism" and "ecocentrism" (4, 25). The traditional attitude is technocentrism which, above all, accepts the *status quo* of political and economic power. The technocentric mode is divided into two groups. First, there are those who genuinely believe that progress is the result of more science, technology, and management in all their forms, and that no obstacle cannot be overcome given commitment and political support. Then there are those who recognize that some concessions must be made towards redistribution of power and environmental protection, but without radical reforms. In both cases, there is a tacit acceptance that current political structures and procedures are perfectly acceptable and should not be unduly changed. On the other side, ecocentrism believes in the finiteness of the Earth and calls for a fundamental change of attitude away from technological means towards a much more humble amd humane approach of harmony with ecological processes and a sense of true association with the Earth. Implicit in modern ecocentrism is a radical vision of human destiny involving quite novel political and economic structures together with a major redistribution of power and resources. Ecocentrists argue that technocentrists cannot create

a sustainable pattern of global living. They are not only suspicious of conventionally applied science and technology, they are equally frustrated with many so-called democratic or participatory procedures through which decisions are made. Various aspects of ecocentrism have become entrenched in a number of movements of modern political dissent (especially in Europe), and environmental issues generally have provided a vehicle for political activism.

34. There is also an emerging and far-reaching trend which stresses the need for equity in using natural resources and enjoying the fruits of development. This is directed towards several spheres. Concern for equity among nations has crystallized significantly around the public view that fairer trading conditions between developed and developing countries are necessary, as is increased official aid. Sustainable development adopts the concept of equity among generations as a central theme, as it is concerned with the state of the world that this generation will hand over to succeeding ones. The concept of equity among species has resulted in greater interest in species conservation and natural resources, and even in vociferous campaigns for animal rights. All these concepts are attracting increasing public support.

35. One way to get some indication of what people think about environmental issues is to ask them by referendum or poll. In spite of the various limitations of this method (26), a referendum or poll may be useful politically. Polls carried out in the late 1960s and early 1970s concentrated mainly on survey of public opinion about specific local environmental issues, like air or water quality. As the environmental issues became intertwined with social, economic and political problems, the surveys became more sophisticated. The quality of life became a central theme, and surveys have been expanded to include regional and global issues and environmental considerations in development activities (such as industrial and agricultural development, tourism, etc). It should be noted that the results of a poll will depend on the structure and characteristics of the sample of the population interviewed. Among the most important characteristics are: education, standard of living, age, awareness of environmental issues, political affiliation, job, etc. Unfortunately, many environmental polls do not break down answers by sex, and so fail to give a picture of differences in attitudes and perceptions between men and women.

36. A 1986 survey in the States members of the European Communities (27) showed that, on the whole, Community citizens are not particularly conscious of pollution in their own local area, indicating that on average the respondents found little to complain about in their local environment, and that the infrastructure services in the community are well managed. There were fewest complaints in Denmark and most in Italy. The public would express concern, however, about new developments in their neighbourhoods, especially if they were to have environmental disadvantages. There is evidence, for example, that even where people are not opposed to nuclear power stations or toxic waste facilities in general, they vigorously oppose having them sited in their neighbourhood. Similarly, while people approve the construction of more houses, they often do not want them built on open land near their own homes. This "not in my back yard" attitude is common in many industrialized countries (28). A survey in Japan (29) showed that 53 per cent of the respondents would oppose the construction of public facilities (such as a super-express railway line, an airport, a garbage disposal plant, etc.) in their neighbourhood, while 35 per cent would co-operate; the remaining 12 per cent were undecided.

37. In developing countries public concern about local environmental problems varies widely from one country to another and even from one place to another in the same country. For example, while people in urban centres may express more concern about air pollution

and noise, those in peripheral settlements (squatter settlements, etc.) may be more concerned about the lack of safe drinking water, sanitation and garbage disposal. In general, dissatisfaction with the local environment increases with population density. Differences also exist between urban and rural areas. People in rural areas are rightly most concerned about water supply and sanitation. A common phenomenon in developing countries, however, is that while many people are deeply unhappy about the sordid physical environment that surrounds them, they accept it as their fate. They become "acclimatized" to such conditions (30). Many people who live in hazard-prone locations perceive the hazard, but live there because hazardous places are cheap to buy or easy to squat on. People in Third World countries are also more willing to sacrifice environmental benefits for development projects in their neighbourhood, for short-term economic gains, or simply for personal survival, as in the indiscriminate and massive deforestation under way in some tropical countries. In Egypt, for example, many farmers used to resort to mining clayey deposits from agricultural land for brick manufacture to gain more income—rendering extensive areas of agricultural land unproductive.

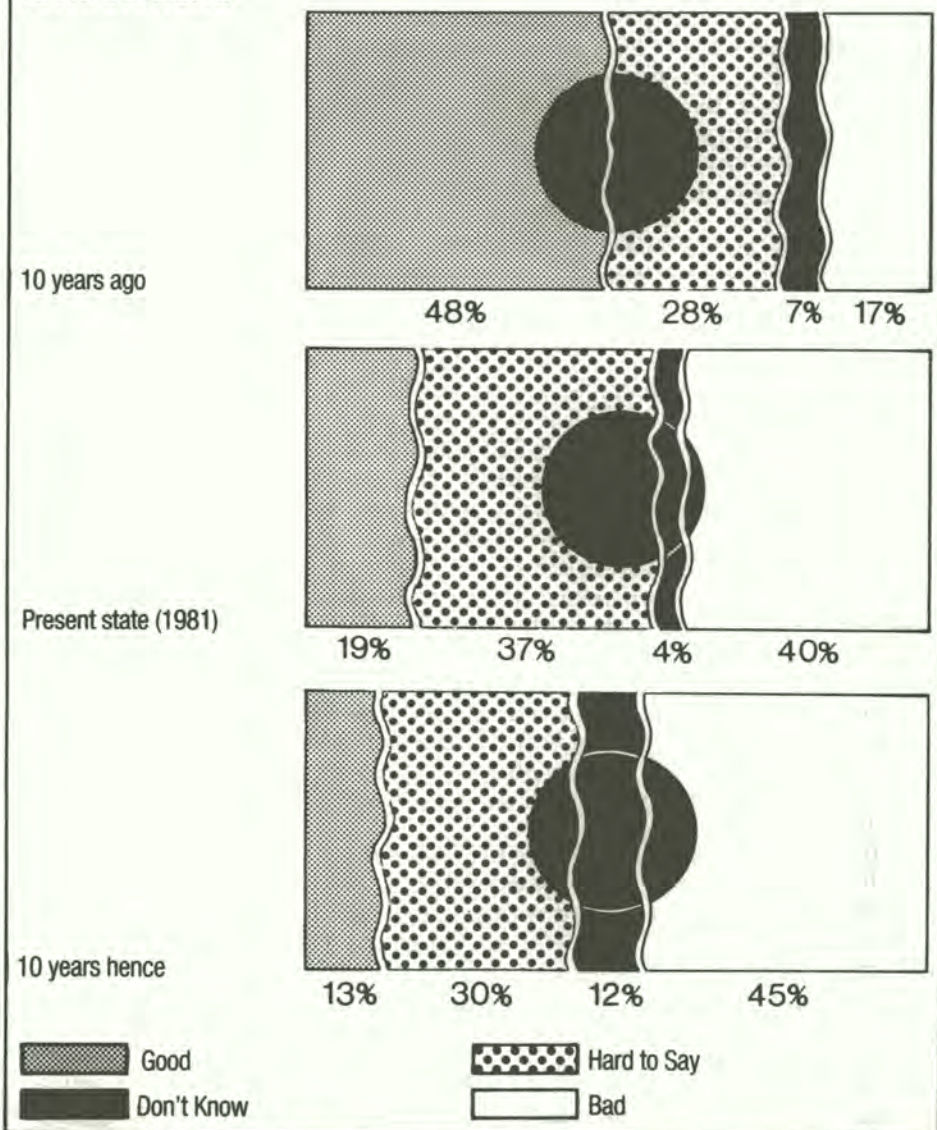
38. Public concern about national environmental problems varies from one country to another. A 1984 survey in the United States (31) showed that the public was very concerned about nuclear waste disposal, followed by industrial waste disposal, damage to the marine environment, water pollution and air pollution. A survey in Japan (29) revealed that air pollution headed public concerns, followed by water pollution, damage to natural scenery, noise and garbage disposal. In 1986, a survey in the States members of the European Communities showed that, on the whole, the public was concerned about damage to the marine environment, pollution of rivers and lakes, disposal of industrial wastes and air pollution, in decreasing order of importance (27). In Australia, according to a survey in the same year, pollution was the most significant area of concern, followed by conservation of flora and fauna and deforestation (32); these findings may reflect media coverage of disputes over wood-chipping, protection of native vegetation on private land and rain-forest degradation in Australia shortly before or during the survey. In Canada, public opinion polls, also in 1986, showed that water pollution and acid rain head the list of concerns: other areas that have recently received public attention there include energy and nuclear power generation, toxic substances, rare and endangered species, and forest management (33). In many developing countries, water pollution and sanitation top the list. Other areas of major concern include deforestation (e.g. in India, Kenya, Indonesia and Brazil), desertification (e.g. in Ethiopia and other countries of the Sahel), ground-water deterioration (e.g. in Qatar and Bahrain) and water and air pollution, noise and garbage disposal (e.g. in Egypt).

39. A few polls gave indications of public perceptions of the general state of the environment, as opposed to specific issues (34). In a 1982 survey in the United States, 41 per cent of respondents said the quality of the environment had "grown worse" over the previous 10 years (i.e. from 1972 to 1982) compared with 29 per cent who believed it had "improved" and 28 per cent who felt it has "stayed the same". In the same year in Japan (29) the public perceived that the quality of the environment had deteriorated and predicted that it would get worse still (see figure 1).

40. Public support for environmental improvements has remained remarkably strong over time. Where public opinion polls have asked the same questions about environmental issues over a period of years, there has been little or no softening of support for stronger programmes despite observable improvements in environmental quality or adverse economic circumstances. In the United States, for example, such support has actually increased since 1980 (34). In the States members of the European Communities, 72 per cent of respondents considered environmental protection as an urgent and immediate issue, a perception that did not change between 1982 and 1986 (27). Public attitudes reflect a desire

Fig 1. Public Perception of the State of the Environment in Japan.

Appraisal of Environmental Pollution and the Natural Environment.



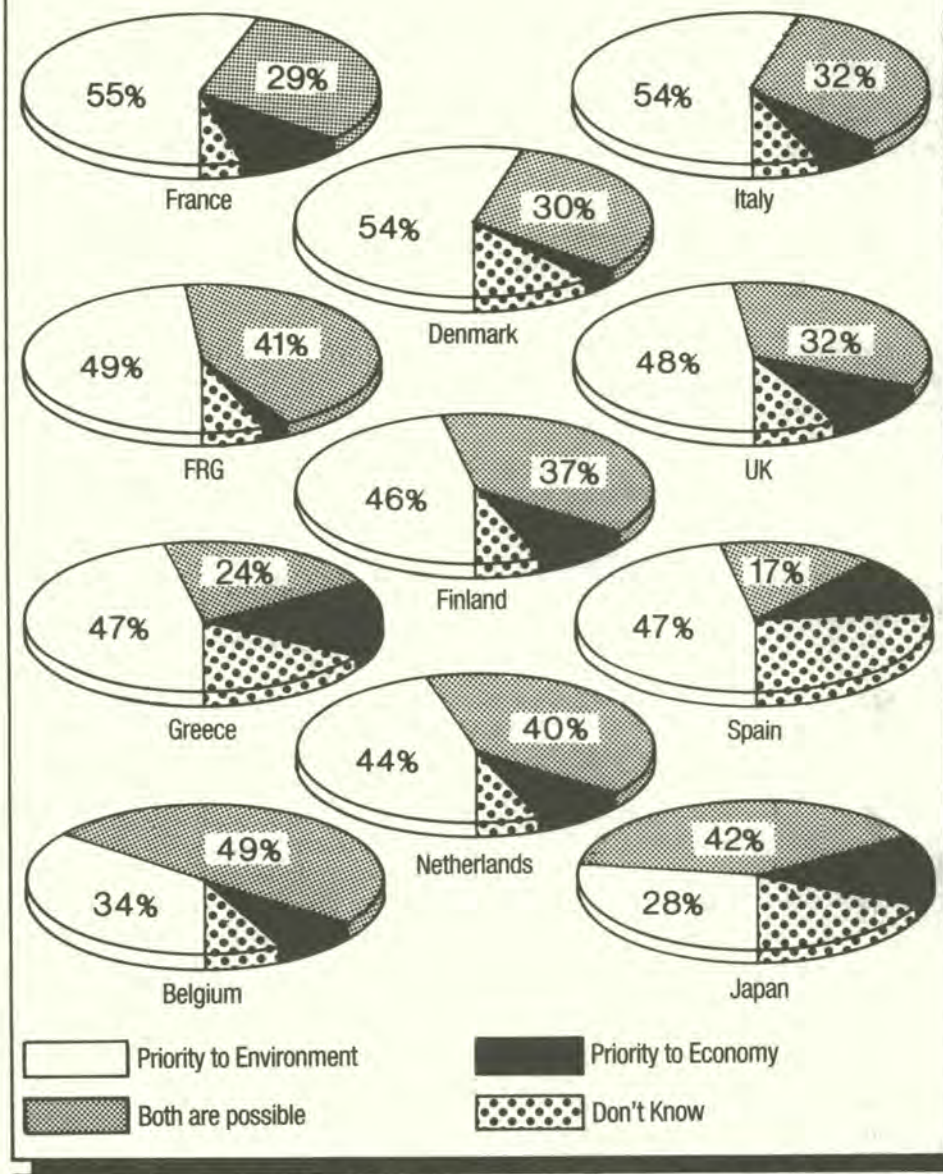
Drawn from data in Environment Agency of Japan, "Public opinion poll on environmental pollution", *Japan Environment Summary*, vol 10 (1982).

for more, rather than less, government regulation and show an increasing awareness of the long-term aspects and broad scope of environmental issues. An important shift has taken place in public attitudes in several industrialized countries with the recognition that the health of the environment and of the economy are linked. Public opinion polls carried out in Canada (33) showed that 82 per cent of respondents agreed, to varying degrees, that the Canadian economy is highly dependent on the state of the environment. The polls showed also that 94 per cent of Canadians agreed that every major economic project should be proven environmentally sound before it could go ahead. Surveys in Japan and several European countries have shown that the majority of respondents gave top priority to environmental protection or considered that environmental protection and economic growth were possible at the same time (see figure 2). Improving public health and living conditions are the main reasons advanced by Europeans for investing heavily in environmental protection. Economic reasons such as attracting new business or developing tourism seemed to have little impact on public opinion. In Denmark, Italy and Greece, emphasis is put on preservation of natural resources, while in the Federal Republic of Germany and Portugal greater importance is attached to making the region "more pleasant to live in". The desire to attract more business into the region takes precedence in Ireland, the United Kingdom, France and Belgium (27).

41. Although similar opinion polls are not available from developing countries, most—with their increasing debt burdens and economic problems—give priority to economic growth, sometimes at the expense of environmental conservation. For example, some countries have been over-exploiting their mineral, oil, or forest resources to increase exports and, hence, their income. In other countries, the public would give priority to environmental protection if it increased economic gains by, for example, leading to an increase in tourism. In Tanzania and Rwanda, surveys have indicated that national parks should be protected and developed as long as they attract more tourists (35). In Tanzania, 42 per cent of the respondents to the survey thought that national parks should be discontinued if tourists ceased to visit them. However, people's attitudes can be considerably changed by appropriate environmental awareness programmes. For example, a study in Rwanda (35) showed marked changes in farmers' attitudes towards wildlife after a five-year conservation awareness campaign. By the end of the campaign, farmers' appreciation of utility of protected forests and wildlife increased, while the percentage of those who believed that national parks should be converted to agriculture fell (see figure 3).

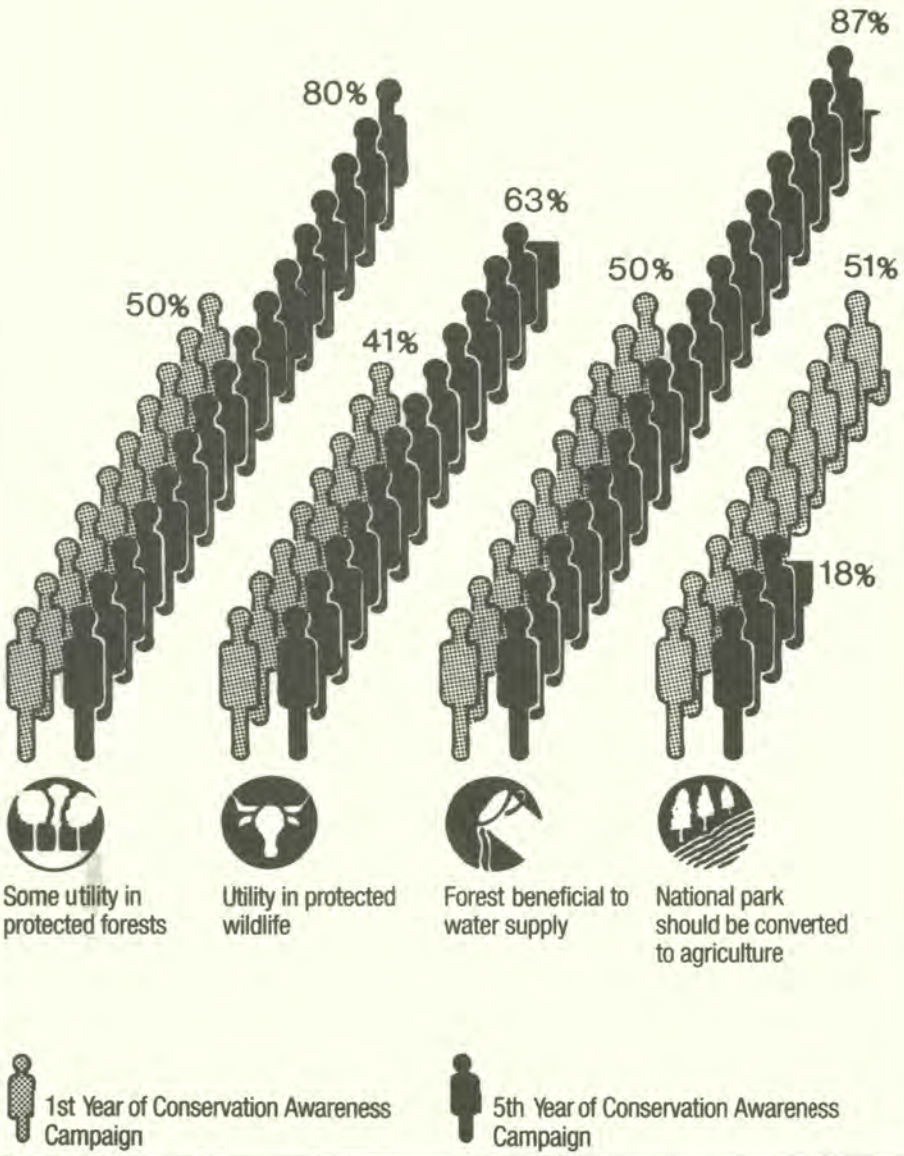
42. Public concern about global environmental problems is high in industrialized countries, though the issues seen to be crucial vary from one country to another. The Japanese, for example, believe the most important global environmental problems to be: environmental pollution by chemicals, deforestation, marine oil pollution, possible climatic changes due to increase of carbon dioxide and other trace gases in the atmosphere, depletion of wildlife resources, possible depletion of the ozone layer, and desertification, in decreasing order of importance (29). On the other hand, in the European Community, extinction of some plants or animal species in the world ranks first among public concerns, depletion of the world's forest and natural resources comes second and the possible climatic changes brought about by carbon dioxide is third (31). In Canada, there is considerable public concern about several global environmental issues including, for example, acid rain, possible changes in climate due to increase in carbon dioxide, possible depletion of the ozone layer, marine pollution, depletion of genetic resources and deforestation (33). In a recent survey of public opinion in Canada about the most important world issues that deserve attention by the Canadian Government in its foreign policy, pollution and the environment ranked highest (98 per cent) in concern followed by major world diseases (94 per cent) and poverty and hunger (93 per cent) (36).

Fig 2. Perceptions of Environmental Protection versus Economic Growth.



Drawn from data given in OECD, *OECD Environmental Data Compendium* (Paris, OECD, 1987).

Fig 3. Farmers' Attitudes in the First and Fifth Years of a Conservation Awareness Campaign in Rwanda.



Drawn from data given in A.H. Harcourt and others, "Public attitudes to wildlife and conservation in the Third World", *Oryx*, vol 20 (1986).

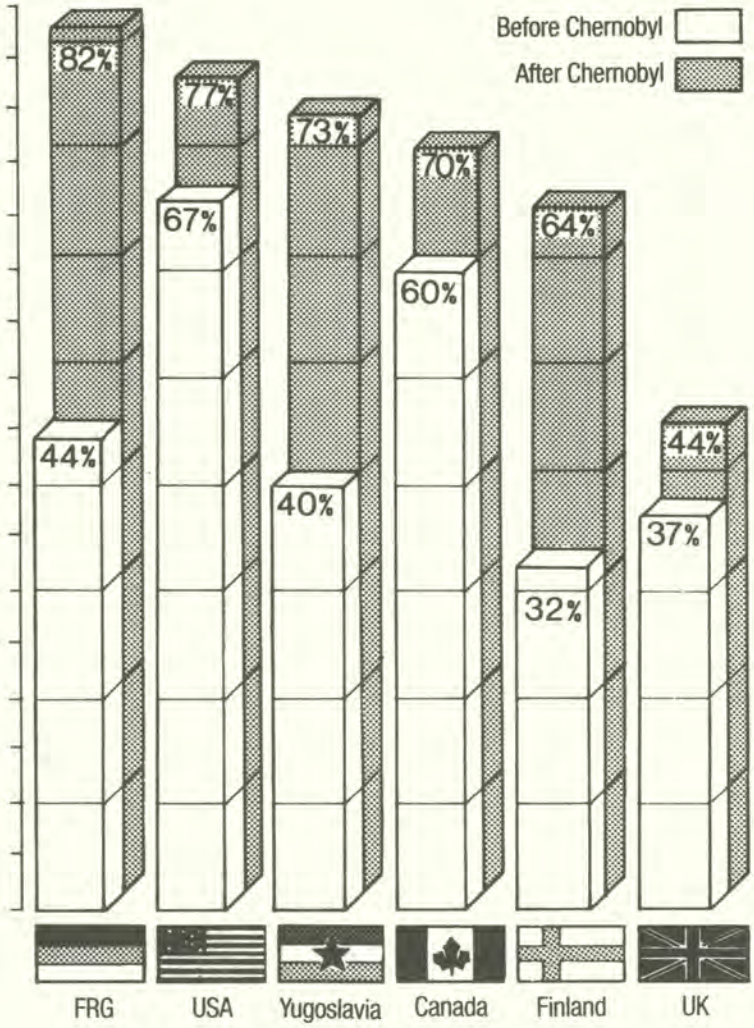
43. Louis Harris and Associates, Inc. (New York) are carrying out a multinational survey of public and leadership perception of environmental issues for UNEP. The surveys have included 14 countries: Argentina, China, Federal Republic of Germany, Hungary, India, Jamaica, Japan, Kenya, Mexico, Nigeria, Norway, Saudi Arabia, Senegal and Zimbabwe. The results obtained indicate that both the public and leadership in these countries are highly concerned about environmental degradation. Both demand stronger action by their Governments and by international organizations to protect the environment. Furthermore, the public and leadership are willing to make material sacrifices and to work with others in their communities to improve the environment there.

44. A common feature in both developed and developing countries is that public concern becomes highly stimulated when a significant hazardous environmental incident occurs. The extensive mass media coverage of the incident plays a major role in this. For example, public concern about the hazards of chemicals and nuclear power respectively peaked following the accidents at Seveso (1976), Bhopal (1984), the Rhine (1986), Three Mile Island (1979), and Chernobyl (1986). This is natural, because the public perception of a hazard is heavily weighted by its severity and very little by its frequency. Perhaps irrationally, people often overestimate the frequency and seriousness of dramatic, sensational, dreaded, and well-publicized causes of death and underestimate the risks from more familiar, accepted causes that claim lives one by one. And there is a substantial difference between voluntary and involuntary risks. Both smoking and driving, for example, involve taking voluntary risks—which is one reason why many people find them acceptable. On the other hand people take a harsher view of risks imposed upon them. Therefore, risk estimates by "experts" and "the public" on many key environmental and technological issues differ significantly (37).

45. For example, although the experts' assessment of the risks of nuclear energy indicate that they are no greater, and perhaps substantially less, than other generally accepted technologies, the public's perception is quite different (38). Opinion polls consistently report misgivings about the release of radioactivity, potential catastrophic accidents, and the disposal of nuclear waste, etc. Attempts to "educate" or reassure the public and bring their perception in line with those of experts appear unlikely to yield quick results because the low probability of serious reactor accidents makes it difficult to perform empirical demonstrations of safety. In addition, disagreement among scientists over the risks of nuclear energy has led to the realization that even the experts' assessments are less hard and fast than previously assumed. Although public opposition to nuclear power occurred in Europe, North America and in some other countries (e.g. in the Philippines, Brazil, etc) before the Three Mile Island and Chernobyl accidents, both events strengthened opposition and caused changes in nuclear policies in some countries (39). Opinion polls carried out in various countries after the Chernobyl accident consistently showed increasing opposition to nuclear power (see figure 4).

46. A recent study by the United States Environmental Protection Agency (40) revealed marked differences in opinion between the public and experts about selected environmental issues. While the public expressed high concern about hazardous waste and chemical plant accidents, the experts ranked these issues as of medium to low risk. Conversely, issues ranked highly by the experts, such as pesticides, indoor air pollution, worker exposure to chemicals and global warming were regarded as medium to low risk by the public. According to the Environmental Protection Agency, one of the main reasons for these differences was that the public did not have all the information that was available to the experts; another was the difference in perception of hazards.

Fig 4. Public Opposition in Selected Countries to Building Additional Nuclear Power Plants.



Drawn from data given in C. Flavin, "Reassessing nuclear power: the fallout from Chernobyl", *Worldwatch Paper*, no 75 (1987), and T. O'Riordan and others, "Nuclear accidents and emergency planning: Sizewell B Inquiry in the light of the Chernobyl disaster", *Project Appraisal*, vol 1 (1986).

47. Such divergences have often frustrated decision makers and have led some experts to argue that the public's apparent pursuit of a "zero-risk society" threatens national, political and economic stability. There is, indeed, no such thing as "zero-risk". However sophisticated and advanced a technology may be, there is no fool-proof technology and no safeguard against human error. Decision makers should, therefore, understand how people think about and respond to risk rather than devoting their attention only to statistical estimates of it. Without such understanding, well-intended decisions and policies may become ineffective. In any case, the public should ultimately decide what risks it will accept. If people are encouraged to become fully involved in planning and decision-making—through participation—both the people and their leaders will learn from each other, society as a whole will benefit, and more durable policies will emerge.

IV. PUBLIC PARTICIPATION

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48. It is impossible to establish a universal definition of "public participation". A wide range of ambiguous terms used in the literature, such as "self-help", "self-reliance", "community involvement", "co-operation", and "decentralization", have added to the complexity of defining it (41). However, from a practical point of view, public participation is basically concerned with involving, informing, and consulting the public in planning, management, and other decision-making activities which can be considered part of the political process. It is that part of the process which provides opportunities and encouragement for the public to express their views. Public participation tries to assure that due consideration will be given to public values, concerns, and preferences when decisions are made. It encompasses the public actively sharing in the decisions that government makes in its search for the public interest. Effective public participation requires the availability of adequate information in public inputs. The latter involves various values, critiques, questions, information, suggestions, and other inputs which are expressed by individuals, groups, or organizations among the general public in efforts to influence decision-making. The inputs may be made through both formal and informal public participation processes and may be solicited or unsolicited.

49. Public participation is not a new phenomenon. Historically, participation and co-operative actions have taken place in particular in rural development. The set-up of rural societies and cultural traditions in these societies have made participation a way of life. The social conditions in poor urban areas characterized in general by shared values and common perspectives, enable people to work together effectively. Many examples exist of such community participation. Community self-help programmes have been under way in many developing countries, including India, Nepal, and Kenya. The most effective system of public participation has been that taking place in the People's Republic of China. Planning at the grassroots level gives full play to creative initiatives at the base and tends to command, as a matter of honour and public morality, instinctive efforts of the people to accomplish what they themselves have proposed. In other countries the situation is different. Not many government agencies are both willing and able to work co-operatively and responsively with the people. Some studies consider that the planners, administrators, and technicians view the people somehow as "the problem" and regard themselves as embodying "the solution". Most government agencies have a legacy of paternalistic or technocratic, if not authoritarian, relations with their publics (42). Most agencies have a doctrine, more often implicit than explicit, which prescribes preferred ends and means, projects a particular self-image, and shapes relations with public groups, encouraging or discouraging participation. For example, a classic doctrine implied in most forestry departments is that their task is to protect trees from people. For such departments to work with residents in and near forests in schemes of community management is almost unthinkable. However, the strong financial support provided in recent years to social forestry projects, the efforts to trigger corresponding institutional changes, and the move to take account of sociological factors affecting people's behaviour with regard to trees have started to yield changes—even in forestry department bureaucracies.

50. Five basic functions are needed to ensure effective public participation—identification, outreach, dialogue, assimilation, and feedback. With respect to identification, it is

important and necessary to identify groups or members of the public who may be interested in or affected by a forthcoming action. As for outreach, the public can contribute effectively only if its component parts are provided with accurate, understandable, pertinent, and timely information on issues, alternatives, and decisions. This information should be shaped along non-technical, general, and value lines. Technical, specific, and detailed information will usually discourage public participation. Wherever possible, the social, economic, and environmental consequences of proposed alternatives, decisions, and projects should be clearly stated in the outreach information. Dialogue should be carried on between personnel responsible for the forthcoming action or decision and the interested and affected members of the public. Dialogue may take several forms such as meetings, workshops, hearings, personal contact, or personal correspondence and may include the establishment of special groups such as advisory committees and task forces. The assimilation of public viewpoints and preferences into final conclusions consists of putting together the results of the "outreach" and the "dialogue" phases. The feedback should include a statement of the action that was taken and show the effect the public's comment had on that action.

51. The effectiveness of public participation depends on the behaviour of different individuals. The individual as a member of the public may respond towards environmental deterioration in one or more of four ways depending on the issue. First, the individual may remain completely unaware or unconcerned because the issue has no impact on his or her way of life or, if it has, he or she is not bothered by it. Second, the individual may recognize the existence of an environmental stress but may adjust to it through a variety of compensating mechanisms. Symptoms of this reaction are commonly found in communities where the major source of employment is a large polluting industry. The source of pollution is not so much seen as contributing to environmental degradation as the provider of income and employment. The third type of reaction by the individual to environmental stress is to assume that nothing can be done about it and that the individual's own concern plays little part in the decision-making process. The fourth kind of response is that of the active participant. Here belong members of citizen and environmental groups.

52. There is no doubt that public awareness of environmental issues and concern about the quality of the environment has triggered several forms of public participation to protect the environment. Perhaps the most important and common form of participation is through the activities of environmental groups. Several of these groups have succeeded in mobilizing support for particular environmental issues and have, thereby, affected the decision-making process in some countries. For example, anti-nuclear groups have succeeded not only in halting the construction of new nuclear power plants (e.g. in the United States of America, Sweden and elsewhere), but also in causing significant changes in nuclear policies (e.g. in Austria, Sweden, the Philippines, and other countries). Many other examples exist of the success of environmental groups in highlighting environmental issues and affecting policy-making process. For example, Sweden's parliament approved a cessation of chemical spraying of forests either from the air or the ground, pending a long-term solution to the problems caused by such sprays. The decision was taken after heavy and continued pressure from environmental groups. Following a public outcry that a fungicide was affecting the health of sugar-cane field workers, the production of Merapicine-3, a mercury-based fungicide, was suspended in Brazil. Pressure from environmental groups largely brought about the phasing out of lead from gasoline in several European countries. Other examples of the activities of environmental groups have been summarized in paragraph 22 to 29 of this report. In 1987, in recognition of effective participation of individuals and organizations, UNEP launched its "Global 500«, annual awards. Each year a number of individuals and organizations are selected from nominations from all over the world and granted the Global 500 certificates of merit for their achievements in different areas of environmental protection and conservation of natural resources.

53. Another important form of public participation is through their "understanding" of the environmental problems facing the society, and their "co-operation" (even by changing their attitudes) in the implementation of solutions to these problems. One of the most important examples in this respect is energy conservation. The increasing use of light automobiles in the United States of America and some European countries since the early 1970s, and the switch to buses and fixed rail transport systems in inter-city travel have led to considerable energy savings (23). The increased efficiency of energy utilization in the United States of America, Europe and Japan during the past decade has been attributed both to changes in technology and in public attitudes. In seven countries (Canada, Denmark, France, Federal Republic of Germany, Norway, Sweden and the United States of America), residential oil use decreased by 40 per cent between 1972 and 1984 (43). One third of this decrease resulted from reductions in oil use per oil-heated home. On the other hand, developing countries face enormous obstacles in attempting to improve energy efficiency. Because fuel and electricity are generally subsidized (in some Gulf countries electricity is even free), there is no or little incentive for energy conservation. The same is true for water. The problem here is how to mobilize public participation to achieve conservation without causing the public itself any economic hardship.

54. Public participation in planning, in decision-making and in management is indispensable for achieving the integration of economic, social and environmental objectives. Such participation provides a safeguard against poorly considered decisions, and a useful means of increasing public awareness of environmental protection and conservation of natural resources and of increasing the awareness of decision makers of public concerns. Participation tends to build public confidence and improve the public's understanding of management objectives; and it provides additional data for planners and policy makers. An example of the importance of the participatory decision-making process is found in the avoidance of an impasse in making policy for managing liquified petroleum gas in the Netherlands, by using various analytical devices within an interactive group process to involve all interest groups in finding an agreeable solution (44). Public participation in the decision-making process has recently increased, especially in developed countries, through what has been known as environmental impact assessment processes. Although the details of these processes differ substantially from one country to another, they usually require that the environmental implications of a proposed action should be analysed thoroughly and that they are described in an impact statement made available to the public. They also include opportunities for the public to react to such proposals and require that the agency responsible takes these reactions into account. Public reaction can take the form of public hearings or public inquiries. Experience at inquiries such as the Sizewell B Inquiry (1983-1985), into plans to build a pressurized water reactor on the Suffolk coast in eastern England, has shown that many difficulties are encountered. Incompleteness of information, obscurity and differences in public perception of hazards are among the factors that complicate such inquiries (45).

55. Public awareness of environmental issues and concern about the quality of the environment do not necessarily imply that the public is willing to participate actively in environmental protection or conservation of natural resources. A recent public opinion poll in Japan (44) showed that while 77 per cent of the respondents indicated interest in nature and wildlife conservation, 61 per cent pointed out that they have not participated in nature conservation activities, 31 per cent participated in "clean-up efforts", and the rest made donation to projects for nature conservation. The survey also showed that the smaller the city the larger the number of people that participated in clean-up and conservation efforts. In large cities, large numbers of people are not willing to participate. In many countries, especially in developing ones, the general attitude of the public is to leave things to the authorities to take care of. Even if the authorities have the resources to deal with local

environmental problems, the public may not co-operate to keep things in good shape. For example, municipalities in some developing countries exert considerable efforts to clean the streets and parks and to plant trees, but some people may spread litter or cut the trees for no important reason. Even the fact that an individual is aware of the risk of a natural hazard, for example, and the range of the measures that can be taken to mitigate it, provides no guarantee that he or she will act on the information. Similarly, many people who know that loud noise is annoying, turn on their radios or television sets at unnecessarily high volumes, or keep sounding their horns while driving. In spite of various television programmes in many countries calling for rational use of energy, water and other resources, there is often no significant resulting progress, especially in developing countries. In 1982, during a vigorous public campaign in the United Kingdom against lead in petrol, 91 per cent of respondents to a public opinion poll said that the metal was a health hazard, and 77 per cent agreed that it should be banned "even if this would put up prices by a few pence per gallon" (47). However, when unleaded petrol was eventually made available some years later, only one motorist in every thousand used it—even though it was no more expensive than ordinary fuel. The Government had to alter the tax régime in 1988 to make the unleaded alternative some six pence cheaper, but even then its use grew only slowly. This provides further evidence that awareness does not necessarily lead to a change in behaviour, though it may be that it was the inconvenience of having to search for one of the small number of petrol stations that sold the unleaded fuel, rather than the lack of a price incentive, that was the main deterrent to change.

56. In some countries, Governments exert considerable efforts to increase public awareness of environmental issues and to encourage public participation. For example, the USSR Government has stepped up efforts to inform its citizens about environmental problems and the necessity of conservation. A large number of reserves *(zapovedniki)* have been established in the USSR. Today there are about 130 reserves occupying an area of more than 5 million hectares (48). Through the policies of *glasnost* and *perestroika,* mobilization of public efforts to protect the environment and conserve natural resources is expected to increase. Emphasis has been given to the adoption of resource-saving technologies, rational utilization of different resources and environmental protection (49). The Federal Republic of Germany went even further to establish an environmental telephone *(Umweltnotruf* or *Umwelttelefon)* in several cities to receive complaints from the public and to answer their questions about environmental matters or to provide on a regular basis a tape-recording of the latest information about emerging environmental issues.

57. It is a well-recognized pedagogic principle that participation in concrete action directed at a given goal greatly increases learning. This is true whether the action is fieldwork or participation in direct efforts for environmental change through official, private or other groups. However, where groups fail to analyse problems in depth and peddle an emotional and simplistic message they diminish the educational effectiveness of the action. Yet the greatest deficiency of many participation exercises is that they do not involve half of the population—and the most important half at that. In several countries women are rarely consulted about important environmental decisions—let alone allowed to participate in making them—though they are very often the people who will be most affected.

V. THE SPECIAL ROLE OF WOMEN

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58. Slightly more than half of the world's people are women: in developed countries there are about 94 men to every 100 women, in developing countries about 103 (50). The United Nations Decade for Women (1975-1985) initiated extensive discussions on the role of women in society, and, in particular, in development. Much of the discussion tended, however, to give the impression that women were powerless, impoverished, over-burdened and exploited, rather than strong, resourceful people lacking only the opportunity to take a full share in society and in development. And in order to publicize the issue, there has been a tendency to isolate women as a target group, as if they were apart from the rest of humanity. Although this has had some positive benefits by focusing greater attention on women, it may not have brought them into full partnership. Women have been, and will continue to be, central to the well-being and development of society, and the world can only fully benefit if their talents are better used, not least in environmental protection and the conservation of natural resources.

59. Generally speaking, women appear to be more concerned about the state of the Earth and the fate of future generations than men. This is natural because women are often the first to suffer from environmental deterioration and underdevelopment. Often they are the first to demand change. In practice, women have several special roles to play.

60. Women are important environmental educators. Young children first learn to see and understand what is happening around them—and begin to feel how they are related to it—through contact with their mothers. As they grow older, education at home is fundamentally important in planting ethics and stimulating change in attitudes. Women can also stimulate changes in behaviour that would lead to marked savings in food, water and energy consumption. Women's education is, therefore, of fundamental importance to enhance their role and active participation in environmental protection and the conservation of natural resources.

61. Although the elements of family planning are well understood, questions remain on how to promote and deliver it. Early marriage and child-bearing in the Third World are inextricably tied to the economic and social rewards that societies attach to children. The failure of many family planning programmes is partly a measure of their failure to approach both women and their men partners as whole individuals. Programmes that deal with women merely as reproductive beings can hardly inspire the broad social changes prerequisite to fundamental changes in attitudes toward family size. Without involving men fully into family planning programmes, without the provision of adequate women's education and without radical improvements in the status of women, family planning cannot fully succeed. And without effective family planning, efforts to improve the quality of life must fail. In Bangladesh, some 1,700 co-operatives with a total of 67,000 members had been established through the Women's Co-operative Project by 1985. The programme provides training, supplies, services and improved family planning and health programmes, thus combining economic and population goals. A 1983 study indicated that 66 per cent of all eligible co-operative members had accepted family planning, and, impressive as this figure is, the project aims at a further 25 per cent increase (51).

62. Infants and young children are very sensitive to environmental perturbations. Malnutrition caused by poor child-feeding practices claims over 10 times as many young lives as actual famine (52). Coupled with diarrhoeal dehydration, malnutrition is the world's greatest killer, causing the deaths of 5-8 million children each year. UNICEF recently pointed out that 14 million child deaths are reported each year in developing countries—and are caused by diseases resulting from lack of safe drinking water, poor sanitation, environmental pollution, poor weaning practices, etc. (53). About 10 million of these deaths are from causes now susceptible to effective low-cost actions, such as nutritional education, breast-feeding, oral rehydration therapy (ORT), and immunization. Women obviously have a special role in implementing them.

63. The extensive literature on women has tended to ignore environmental factors and to focus mainly on the changing roles of women in social, economic and cultural systems. Women increasingly work outside the home adding to the considerable responsibility and physical strain that they generally also carry in home-care and child-care. Recent studies by social scientists, architects and planners have begun to examine systematically differences in the ways men and women use and control environments, and the implications of these differences for the planning and design of human settlements. Women generally spend more time in the home and the neighbourhood than do men (54), but very few participate in the original design of these environments. Yet, the provision of minimum acceptable standards of housing and essential amenities would go a long way in reducing their burdens. Research has shown that women bear the greater social costs of living in new communities—often stuck in isolated environments that lack day-care facilities, jobs and educational opportunities for job upgrading. Planning practices that create homogeneous residential areas, single-use zoning, urban sprawl, and inadequate public transportation and support services, are partly responsible. These environmental problems are often exacerbated by poverty, especially among sole-support mothers and the elderly.

64. Because they generally spend more time at home, women and children are more exposed than men to indoor pollutants. Elevated concentrations of carbon monoxide, carbon dioxide, nitrogen oxides, formaldehyde, particulate matter and other pollutants have been reported indoors due to emissions from gas and kerosene-fired appliances and from wood-burning fires (23). Women need to be aware of the health hazards of these pollutants so as to be able to prevent them. In rural, and some urban, areas of developing countries, the burning of fuelwood, agricultural residues and dung cakes, in open or semi-contained fires, results in several emissions that adversely affect health (55, 56, 57), most importantly through chronic obstructive pulmonary disease and naso-pharyngeal cancer (56). Women in such areas have not been aware of these hazards and seem to have become "acclimatized" to the smoke from burning such fuels. But women have also been quite happy to switch from fuelwood and dung to biogas, particularly in China, India, and some other countries. They see biogas as a much cleaner and more efficient fuel. So they participate actively in the construction, operation and maintenance of family-size biogas plants.

65. In squatter settlements and rural areas of developing countries water supply and sanitation present everyday problems, adding considerably to women's burdens. Obtaining water and making it more readily available for domestic use has traditionally been women's work in most of these areas. In Wayen, Burkina Faso, mothers walk daily for two or three hours to stagnant water holes in a river 12 km away and return with 25 kg of water on their heads. According to WHO, the trip consumes up to 600 calories a day, one third their average food intake (58). Nearly 30 per cent of women in rural Egypt have to walk more than 60 minutes per day to meet their water needs (59). Although pump water is used for cooking and drinking, canal or pond water is used for washing and bathing (especially of children) in

rural areas. This is certainly one of the reasons behind the spread of schistosomiasis among rural children in Egypt. Because water is scarce and fetching it is hard, rural women conserve water carefully by reusing it. Yet, water lost from malfunctioning standpipes and other central connections in some rural areas in Egypt amounts to 30 per cent (60).

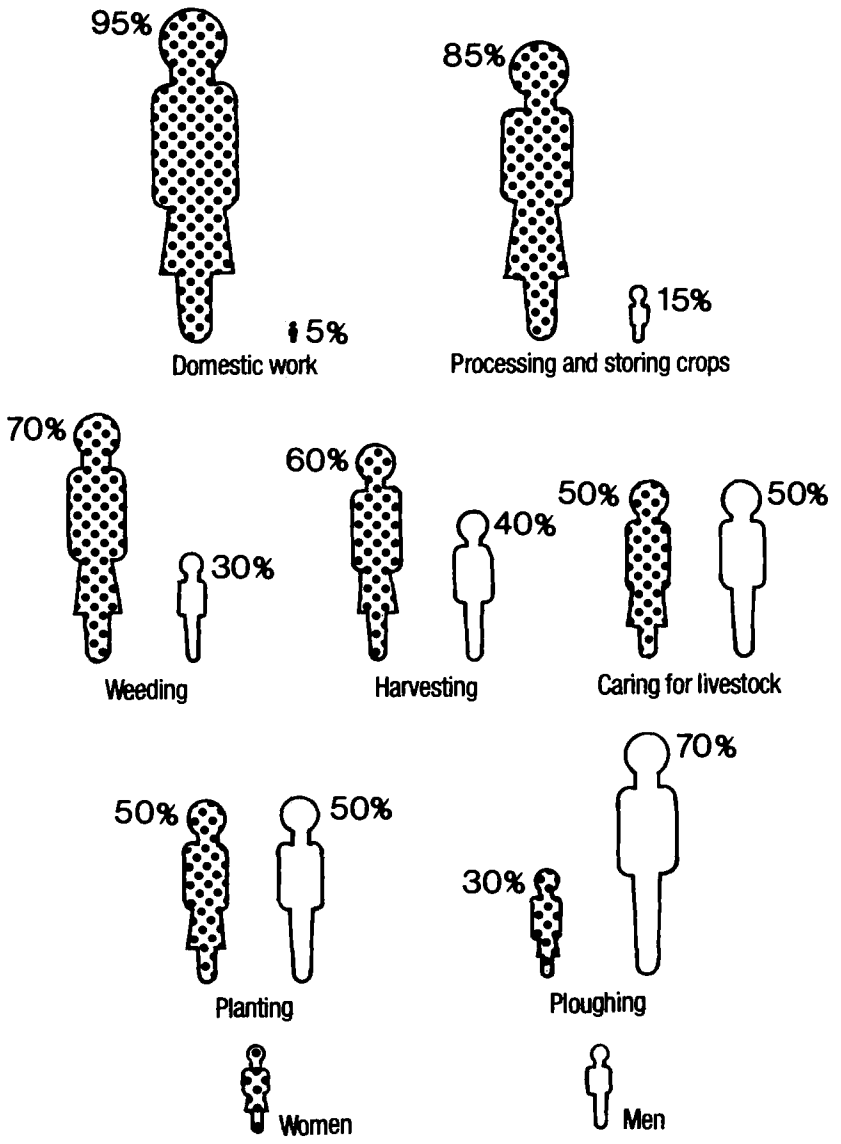
66. In some rural areas in developing countries, women have taken the initiative to ensure an adequate supply of water. For example, women participate actively in the Dodota Water Supply Project in Ethiopia, and after training, they play an active role in planning, execution, operation and maintenance of the water supply system (58). In Kenya, women initiated a UNICEF/NGO water-for-health programme in 1977, which has now supported a total of 82 community water projects to varying degrees. In areas where domestic water was made available several improvements have been achieved in community life (for example, improved health conditions, establishment of demonstration farms run by women, improvement in the awareness of health care and good nutrition, increased breeding of domestic animals and birds, etc.)

67. Wood remains the main source of energy in many urban and rural areas in developing countries. People in these areas use between 1.3 and 2.5 cubic metres of fuelwood per person each year (55). In addition, agricultural residues and cow dung are often used as fuel. Men, women and children have distinct roles in fuel supply and use. Men usually cut down trees to be used for household fuel. Women and children are responsible for collecting branches, bushes, crop residues and cow dung. Women in northern Ghana may need a whole day to collect three days' supply of fuelwood. In rural Kenya, some women spend 20-24 hours per week at the task. Meanwhile, headloading—collecting fuelwood, carrying it and selling it elsewhere—has become an important activity for women in some countries, including India (61). Fuel is also a key raw material for most of the activities women undertake to supplement their incomes—such as food-processing, beer-brewing, pottery-making, and others (61, 62, 63). But as the availability of fuel wood decreases and its cost rises, these activities become less viable and sometimes have to be abandoned.

68. In several developing countries, tree-planting programmes are under way to face the fuelwood shortage. Women actively participate in most of them. Women's groups are actively involved, for example, in the work of the Kenya Energy Non-Governmental Organisation (KENGO), a platform for more than 200 NGOs dealing with energy issues. Its main objective is to safeguard energy supplies, for example, through disseminating information about fuel-saving stoves, and promotion of reafforestation using indigenous trees. The Green Belt Movement in Kenya (see paragraph 25 above) has also been extremely active in tree-planting. In Zimbabwe, the Association of Women's Club (AWC) has embarked upon tree-planting projects in various areas, using drought-resistant indigenous and gum trees. Many rural women seem traditionally to have practiced agroforestry, producing wood for fuel alongside food (62, 63). It seems to have been long practiced by Sahelian residents, and has only recently been "re-discovered" by forest development experts (61). The typical landscape of Sahelian countries is "farmed parkland", consisting of individually managed fields,pastures and fallows, dotted with trees.

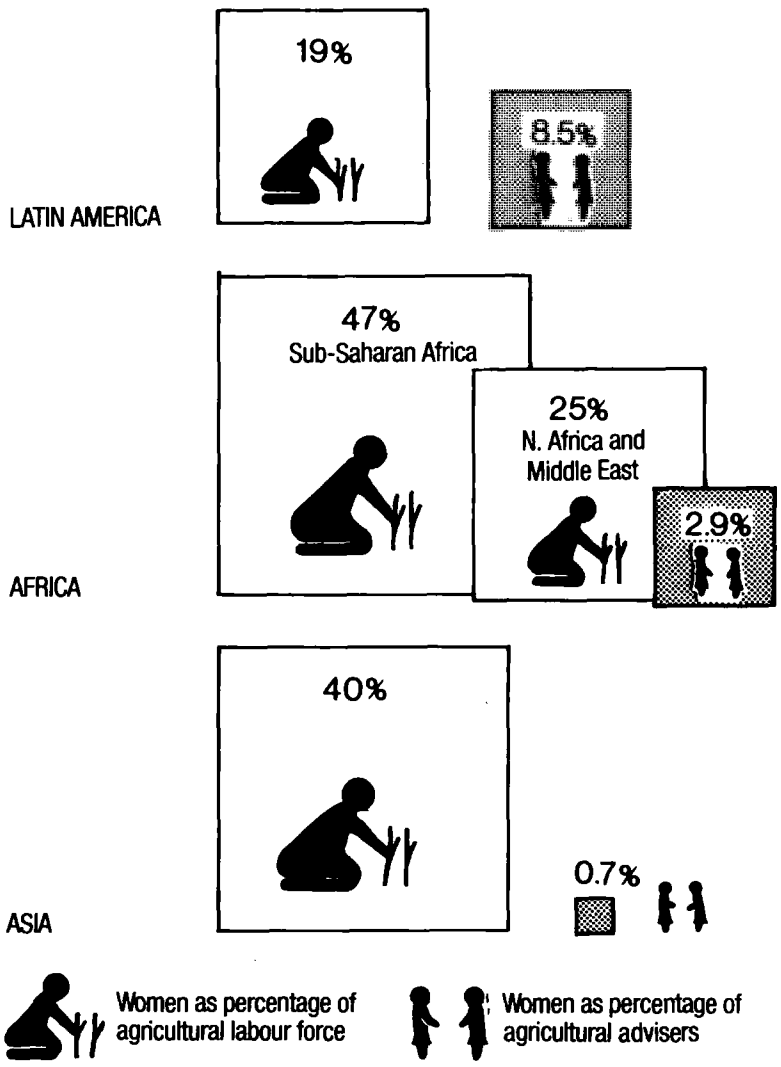
69. Women perform key agricultural tasks in all regions of the world, ranging from hoeing, seeding, weeding, spreading fertilizers, harvesting, threshing, winnowing grain, and storing products, to selling agricultural items (raw or processed) in the market (see figures 5 and 6). Women are also traditionally responsible for all the work of animal care, including feeding and providing water, milking, cleaning out stables, and processing animal products such as cheese for food or dung cakes for fuel.

Fig 5. Percentage of Each Type of Agricultural Work Done by Women and Men in Africa.



Drawn from data given in Economic Commission for Africa *United Nations Handbook on Women in Africa* (Economic Commission for Africa, 1975).

Fig 6. Women as Farmers and Agricultural Advisers.



These figures underestimate women's involvement in agriculture because their agricultural work is often under-reported.

Drawn from data given in Food and Agriculture Organization, *Women in Agriculture*, No 1, (FAO, Rome, 1984).

70. At work in the field, factory or office, women and men are exposed to different pollutants. Yet, women generally suffer more. High rates of infertility, spontaneous abortion, stillbirth and neonatal deaths have been associated with increased exposure to several chemicals. Since infants are obligate milk feeders, they will ingest chemicals that cross the mammary gland during lactation. Examples of chemicals known to be selectively concentrated in the breast milk include pesticides such as kepone, mirex, chlordane, aldrin, dieldrin, DDT and its metabolites. A survey by GEMS (64) revealed that the daily intakes of DDT by breast-fed infants in some countries like China, India and Mexico are higher than the acceptable levels established by WHO. The risks of exposure to different chemicals can be effectively reduced if women become increasingly aware of them.

71. Women can play special and important roles not only in environmental protection but also in conservation and effective management of different resources. They can promote changes of lifestyles to optimize the use of resources and at the same time achieve a better standard of living. But both women and men need adequate information to make decisions, and it is the role of the media, in all their forms, to provide it.

VI. THE ROLE OF THE MEDIA

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72. Ever since the first cave-painting, the first script—indeed, the first ever conversation—people have been communicating with each other about their surroundings. For almost all human history communication has been entirely a small-scale person-to-person affair whether by word of mouth, handwriting, songs, pictures or theatre. Even after the invention of the printing press, mass communications took centuries to develop. But in a few decades there has been a communications explosion all over the world. Between 1975 and 1985 alone, the number of radios worldwide increased by 58 per cent, while the number of television receivers nearly doubled, showing a 91 per cent increase. The biggest expansion was in Third World countries: the number of radios more than doubled (up 116 per cent) and that of television sets increased threefold (65). The Unesco target set in 1961 of one television set per 50 people has been achieved for the Third World as a whole. Brazilians watch more television per capita than the people of any other country in the world. India had one million television sets in 1980, 7 million in 1985 and is expected to have 35 million sets in 1990; transmission will then reach some 300 million people. China has a potential television audience of 600 million (66).

73. The medium (or media) used most frequently to obtain environmental information varies from one country to another and depends on education and socio-economic levels. A study in the United States showed that newspapers and television, in that order, were the major sources of environmental information (67). It showed that the more adult education increased, the more newspapers were preferred to television. Other print media, especially books, were perceived as more believable sources of scientific information on the environment. Another study in the United Kingdom showed that 52 per cent of a sample of the population trusted television news programmes about the environmental impacts of nuclear power, while 33 per cent expressed more trust in newspaper and magazine articles (68). A third study showed that television is the most important source of environmental information among children and the elderly (69). In developing countries, where illiteracy rates are high, radio and television predominate. But there are also wide variations, even in the same country. For example, in Egypt, television and newspapers are the main sources of information in major urban centres, in semi-urban and rural areas radio and television predominate, while in remote areas radio is the main source of information (70).

74. Yet there is good evidence that the power of the mass media to influence attitudes in rural areas of developing countries, where environmental pressures are strongest, is very limited, at least in South Asia. Traditional interpersonal forms of communication appear to be far more effective. The mass media generally appears alien, almost always projecting the values and priorities of élites in the cities, rarely communicating in local dialects, impossible to involve in dialogue. Experiments and studies in the region demonstrate that poor people respond most readily when communicators relate to their own local circumstances and cultures, and when they interreact with their audiences. One Unesco study on the effect of health and nutrition education and agricultural extension work in Sri Lanka showed that peddlers of nostrums were by far the most effective communicators, followed by balladeers, monkey performers, acrobats and tom-tom beaters; television and even posters were far less influential. The electronic media have generally only proved persuasive in South Asia when

they have adopted the main ingredients of traditional methods of dissemination—humour, discussion, illustration through dramatization and song and dance—as in successful programmes in Nepal, Sri Lanka and Ahmedabad, India (71, 72).

75. Stimulated by such findings, international agencies, NGOs, Governments and advertizing agencies have tried out traditional media—frequently successfully (71). In 1986, UNEP supported a project proposed by the Asian Mass Communication and Research Centre in Singapore to transmit environmental messages through traditional touring theatre troupes in the Philippines and Indonesia and traditional song drama performed on television in Thailand; the project proved successful in all three countries (73). The work of the folk poet Ghanshyan Raturi proved crucial to the success of the Chipko Movement (see paragraph 24 above) by creating awareness in the villages (17). Many traditional stories, songs and poems display a healthy respect for the environment, and provide great potential for using this form of communication (71). There are 1,000 traditional media troupes in central Thailand alone (72).

76. Even in developed countries and cities in the developing countries, alternative media, like popular music, art, the theatre (including street theatre) and films, play an important part in forming attitudes, and have, at times, conveyed powerful environmental and development messages. Here, however, the mass media are undoubtably very influential—and sections of it have long been in the forefront of creating environmental awareness. The *National Geographic* magazine was founded 100 years ago in the United States, and has been followed by such journals as *Geo* in the Federal Republic of Germany, *New Scientist* in the United Kingdom, *AMBIO* in Sweden, and *Country Life* in the USSR. Programmes on nature and wildlife—such as the British Broadcasting Corporation's natural history productions—became established in the 1950s as television began to reach a mass audience and proved extremely popular. Today wildlife series frequently achieve higher audience ratings in the United Kingdom than popular sports programmes, and an hour-long Saturday afternoon environment programme regularly reaches about a third of Belgian homes (74). Regular environmental series have also been established on British commercial television, the United States Public Broadcasting Service, Australian national television, and Canadian radio (among others) for more than two decades. Two environmental film festivals, Ecovision and Wildscreen, are regularly held in Europe and a recent survey showed that 95 per cent of European television stations were willing to participate in environmental co-productions (74). The Television Trust for the Environment has recently reviewed environmental films from developed and developing countries throughout the world (75) and has stimulated production in 23 countries. Newspapers in developed countries gave extensive coverage to the growing environmental movement in the late 1960s and early 1970s, forcing Governments to take it seriously—and though there was some loss of interest in the mid to late 1970s, their coverage has been expanding again in the 1980s. Newspapers and magazines in developing countries are also giving increasing space to environmental issues.

77. However, environmental issues still remain a relatively marginal concern in most newspapers and television news and current affairs programmes. Far more attention is given to national politics, labour disputes, the arts and business, despite evidence that the readership of quality newspapers—and especially women and young people—prefer to read about environmental issues (76). One newspaper industry survey in the United Kingdom showed twice as many readers to be "very interested" in conservation news as in politics, more than three times as many as in industrial disputes, and more than 10 times as many as in business—and it was the only category of 30 or so where readers wanted the coverage increased (77). In part, the serious newspaper media lag behind their readers because news is concerned with events, whereas most environmental issues concern processes that present

few obvious news "pegs". In part, it is because the environment has emerged as a newsworthy issue during the past two decades, long after many senior news executives first formed their conceptions of news priorities. The emphasis given to the environment, as to all issues, is also usually determined by the priorities of the owner of the newspaper or broadcasting station, whether it be a Government or private individual or company.

78. Journalists reporting environmental news—like any news stories—are subject to tight constraints on both time and space. They have only hours, at best, in which to find out and digest an often complex array of facts and opinions, assess their significance and the relevant weight to place on widely contrasting opinions and recollections, gather reaction, and write or broadcast their stories. They also usually have to compress this material into a few hundred words, expressed in simple language. These constraints inevitably lead to varying degrees of distortion, whether through simplification, snap judgements, or through concentrating on factors that seem immediately important at the expense of those which may prove more significant in the longer term. Producing accurate, honest, informed and balanced reports under these constraints demands considerable skill, which several, though by no means all, journalists develop to a high degree. The media also frequently tends to be self-imitative and prone to fashion, developing sudden interests, often triggered by particular events, in particular topics and then, as suddenly, becoming bored with them.

79. "Trigger" events, either disasters or threatened disasters, have therefore greatly increased the interest of the news media in environmental stories (78). Events like smog episodes in London in 1952 and New York in 1963, the 1976 Seveso accident (1976), the wreck of the tanker *Amoco Cadiz* in 1978, the Three Mile Island nuclear power accident in 1979, the Bhopal tragedy in 1984, the pollution of the Rhine in 1986, the Chernobyl nuclear accident, also in 1986, and others, received extensive coverage by the press, radio and television, partly because they have inherent public appeal. For example, the Bhopal accident was ranked as the second biggest news item in 1984 by the Associated Press editors, and the Ethiopian drought ranked third (79).

80. Because news is (almost by definition) about the unusual, the media generally emphasize hazards that are relatively serious and/or relatively rare. Catastrophic events are reported much more frequently than less dramatic causes of death and damage with similar (or even greater) statistical frequencies (80, 81, 82). For example, car accident—the result of a well-known and widespread risk in both developed and developing countries—only become major news stories on the rare occasions of multiple collisions, while leaks of toxic or radioactive substances that kill far fewer people often receive considerable coverage. Similarly, so-called "miracle" cures or crops make news, while steady progress in research does not.

81. This natural predisposition towards the dramatic ensures that the information provided by the media about risks is frequently inadequate. When environmental risk is reported, the emphasis is usually on its more alarming features. The media are superb at evoking the serious outcomes associated with a particular instance of a hazard, but they generally do not put such risks in perspective. The stark language of news—that is, the words and pictures used to convey information—also leaves room for interpretation, especially in the absence of background information. An analysis of 952 print and broadcast news stories in United States media about the Bhopal disaster in the two months immediately following the event revealed that both print and broadcast reports were event-centred and included little or no discussion of underlying social, cultural and economic forces that accounted for the chemical plants construction in India. Instead, news reports focused on the disaster itself, the immediate aftermath, and what was being done to clean up the mess (82). Television news coverage of the Bhopal disaster was the most

event-centred. Television did not construe Bhopal in a larger framework of technological hazard, and there was little discussion of the various long-term health, environmental, social, or legal issues the tragedy raised. Only after the main immediate news events surrounding the accident subsided, did the media pay more attention to such factors (83). Similarly a study of the Indian media's coverage of environmental issues found that newspapers failed to do enough investigatory reporting into the environmental impacts of the construction of the proposed Silent Valley dam and relied too much on superficial news stories (76).

82. The Task Force on the Public's Right to Information of the President's Commission on the Accident at Three Mile Island highlighted another example of the unreliability of media coverage of environmental disasters, calling coverage of radiation "abysmally inadequate". The Task Force accused the reporters covering the Three Mile Island of making improper comparisons and factually impossible statements and providing insufficient background information (84). A study of the United States media coverage of the Chernobyl accident showed that, although about 50 per cent of newspapers articles and television broadcasts gave information about radiation, there was not enough coverage, both of the actual situations and levels of radiation and of the explanatory information, that would have helped readers and viewers understand radiation and risk (84).

83. Such failings in reporting lead to public misconceptions. For example, in spite of all the coverage of nuclear issues, the majority of the public does not have a clear distinction between nuclear power plants and atomic bombs—and tends to view civil nuclear accidents as potential Hiroshima-style explosions (85). Polls taken in the United States after the Three Mile Island accident revealed that only one third of the respondents knew that such an explosion in a nuclear plant was impossible (86). The inadequacy and bias of the media coverage of the environmental impacts of nuclear power in some developing countries (e.g. in Egypt and the Philippines) has created confusion rather than educated the public about the issues and about the costs and benefits of this method of electricity generation (87).

84. The news media seem to judge the severity of a disaster by the number of deaths and injuries, the extent of property damage, and the geographical scope. However, a disaster's severity alone does not establish its news value. The news media also need to know who and where a disaster's victims are (88, 89). Other factors may affect a disaster's news value, for example politics, timing, geographical distance, the likelihood of its replication on home territory, and simply the boredom threshold of journalists and the public. Although only 31 individuals were eventually reported killed by the Chernobyl accident, the event received 129 minutes of *CBS Evening News* coverage in the United States over a 33-day period in April and May 1986. The coverage of the 1979 Three Mile Island accident—in which no one died—also received far more attention than natural and environmental disasters like earthquakes and floods. To give the other extreme, the 1976 Tangshan earthquake in the People's Republic of China killed an estimated 800,000 people but received less than 9 minutes on the average television network evening news (88, 89, 90).

85. On the other hand, news coverage of the environmental disaster can trigger regional or international action. Here the limitations of news coverage can actually have a positive effect, because the starker and more dramatic the message the more effectively it gets across. For example, in 1982-1983 FAO and UNEP had consistently warned of the likelihood of famine if the drought in Africa, especially in Ethiopia, continued. When famine did come in 1984, it was reported by newspapers and radio, with little effect either on public opinion or on donor country policies. It took television to bring about the change. UNEP worked with Central Television in the United Kingdom and the Television Trust for the Environment to

produce *Seeds of Despair*, an award-winning documentary first screened in Britain in July 1984, which brought the crisis to mass public attention and stimulated public concern, and in turn led to Governments giving it higher priority. But it took the direct impact of a British Broadcasting Corporation television news report, in October the same year, to set the issue alight, triggering blanket coverage by the rest of the mass media around the world, inspiring enormous public generosity and pressure on Governments, and bringing about the long-delayed international action (91).

86. Once a dramatic environmental event subsides, the media turn to other subjects. This, in turn, is reflected in declining public concern: given less attention by the media, the public often perceives problems as less serious. A study in Canada (92) showed that public concern about pollution dropped by half between 1970 and late 1971 as the media turned its attention from the environment to energy, inflation, unemployment etc. A second Canadian study (93) demonstrated a similar decline in concern about air pollution in Toronto between 1968 and 1978.

87. Many reporters and editors are not sufficiently sensitive to, or interested in, environmental issues to follow up the big news events or to undertake in-depth investigatory reporting about them (94). Most have little experience with the subject matter, and so face particular problems in putting a fast-breaking environmental story in perspective. Their sources are likely to be limited, serving particular interest groups—whether Governments, industry, or NGOs. Distortions also occur when reporters try to translate technical jargon into more familiar—but often more volatile—lay terms. Most of these problems can be overcome by encouraging the emergence of skilled, full-time environmental specialists who maintain a constant interest in the issues, develop a considerable understanding of them, learn the technical language and develop sources they can trust. In recent years, such specialists have been emerging in many countries (74, 77). They still have much to do to persuade their newspapers and broadcasting stations to accept their priorities and perspectives, and deserve support.

88. Scientists and other experts can also do much to encourage better reporting. They should be prepared to express their knowledge and the results of their work in simple terms to avoid the risk that journalists will distort the scientific information as they simplify it. They should be ready to talk to reliable journalists on responsible newspapers and programmes; journalists do not rely enough on disinterested experts, partly because they are often reluctant to give information. Experts, particularly in Government, should be open. Secrecy—and especially the half-kept secret—fuels fear and breeds distortion, since the little information that does get out inevitably has a disproportionate impact.

89. Although coverage of environmental issues by the media, particularly the print media, has become increasingly sophisticated and knowledgeable over the past decade, public trust in different media still varies greatly. An opinion survey in the United States of America (67) found that only about 55 per cent of respondents perceived media personnel as "telling the truth" about environmental topics; 58 per cent perceived a political leaning; and about 81 per cent felt the media sensationalized and were selective in order to maximize their audience. A survey of Indian students (76) found that 74 per cent of them felt that newspapers could only play a limited role in creating mass interest in current environmental problems; inadequacy and superficiality of coverage was one of the reasons for this verdict, along with mass illiteracy and indifference among readers.

90. On the other hand, a British survey showed that all media are trusted more than government ministers and officials, and the nuclear industry, for information about the environmental impact of nuclear power. Those trusted most of all were people living close to

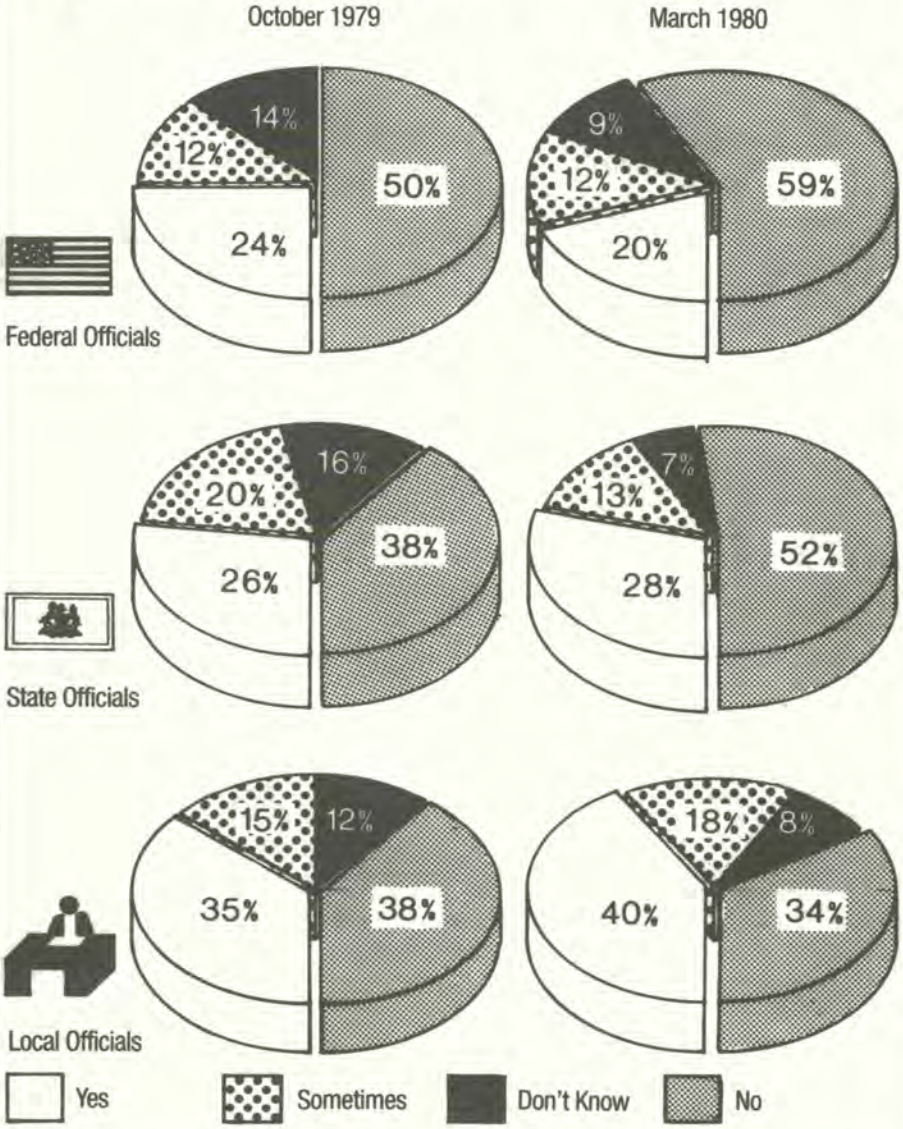
nuclear power plants. Two surveys carried out around the Three Mile Island plant in the year after the accident turned up similar results (86), showing that public trust of information from Federal and State officials was very low, while information given by local officials had greater credibility (see figures 7 and 8). It seems that there is somehow a public mistrust of information originating from government officials in almost all countries.

91. The media, by reflecting public concern, has been instrumental in legitimizing it. The environment now has institutional identity in the form of government departments, and a wide range of official and unofficial agencies. The media are now acting more and more as a bridge between the public and decision makers. Media campaigns—as in the United Kingdom, over the Clean Air Act in the 1960s, controlling heavy lorries in the 1970s, and phasing out lead in petrol in the 1980—have voiced and mobilized public concern and led to government action.

92. Improving the availability of environmental information to the media, and then properly reporting such information to the public, is critical for the management of environmental problems. The success in environmental communication is not to be measured by public acceptance of the solutions formulated by the decision makers; it is achieved when the best solutions are knowingly chosen by a well-informed public. One of the most important roles of the media is to expand the audience for debate on a particular issue. This frequently leads to redefining and broadening the scope of the problem and often creates new issues and more controversy. These new issues and the expanded audience for the policy discussions have frequently frustrated decision makers and made them feel that the resolution of problems has become more difficult. But, at the same time, they have resulted in new thinking to include the new dimensions that emerged from the debate of a wider audience. This usually leads in the end to better, more enduring policies.

Fig 7. Trust and Credibility of Information from Officials about Three Mile Island Accident.

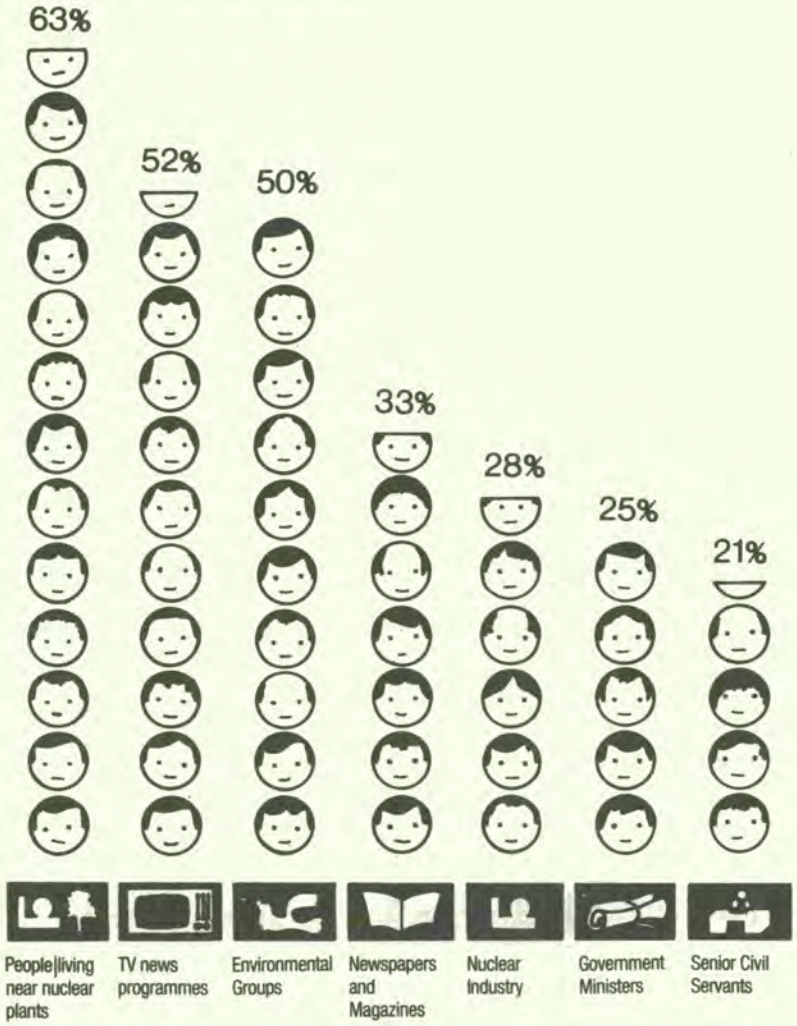
"Do you feel the information was truthful from..."



Drawn from data given in R. Goldsteen and J.K. Schorr, "The long-term impact of a man-made disaster: an examination of a small town in the aftermath of the Three Mile Island accident", *Disasters*, vol 6 (1982).

Fig 8. Trust about Truth of Information on Environmental Impacts of Nuclear Power in the UK.

Trust great deal/Fair amount



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