



WORLD COMMISSION ON ENVIRONMENT AND DEVELOPMENT

SEVENTH MEETING  
Moscow, U.S.S.R.  
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WCED/86/26

TO: All Members of the World Commission on Environment  
and Development.

FROM: Nitin Desai  
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DATE: 20th November 1986

RE: SEVENTH MEETING OF THE COMMISSION

Commissioners will recollect that they decided at the Harare meeting to combine the first three chapters discussed there into two. Basically the material from the old Chapter 2 "Environment-Development Connection" was to be used in appropriate places in the new Chapters 1 & 2. Specific suggestions regarding this restructuring were presented at the final plenary session at Harare.

The present draft of Chapter 1 incorporates the restructuring suggested at Harare. It also incorporates the section on "New Imperatives", which was presented to the Commission at the final plenary by Commissioner Strong, under a new title "Retrieving the Future".

The present draft which has been edited by Linda Starke also incorporates some editorial changes, new titles for the Chapter and the subsections and a tentative selection of quotations from the public hearings with an indication of roughly where they would appear in the final text.

**ACTION REQUIRED:** For Discussion and Approval

**CHAPTER 1**  
**A THREATENED FUTURE?**

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## CHAPTER 1

### A THREATENED FUTURE?

1. The Earth is one but the world is not. Politics and property divide us, and each little bit of the world struggles for survival and prosperity with little regard for its impact on others. Some of us consume the Earth's resources at a rate that would leave little for future generations. Others, many more in number, consume far too little and live a life of hunger and squalor, disease and early death.

2. In an age of unprecedented productive capacity, millions of people are undernourished and lack the basic facilities for a decent life. Many parts of the world are caught in a vicious circle - with poverty leading to ecological stress and economic decline, which in turn leads to still greater poverty. Even the prosperity attained in some parts of the world is precarious. It has been secured at the cost of unsustainable changes in land use patterns, in forest cover, in air and water quality. It rests often on the deterioration and depletion of natural resources, not just in the prosperous regions but also elsewhere. And it carries widening risks of irreversible damage.

3. Never before has our home on Earth been exposed to such great political and physical stresses. Never before have humans exacted so much tribute from nature, and never have we been so vulnerable to the forces we have created.

The scale of our interventions in nature is increasing and the physical effects of our decisions spill across national frontiers. The growth in economic interaction between nations amplifies the wider consequences of national decisions. Economics and ecology bind us in ever-tightening networks, and now more than ever we need international cooperation. The course of history, of social progress, requires constructive and creative interaction between states and peoples the world over in order to prevent catastrophe - indeed, in order that civilization survives. Yet the trend is towards an assertion of national dominance and a decline in multilateralism.

4. Little time is available for corrective actions. In some cases we may already be close to transgressing the limits that define the Earth's ability to sustain life, and many risks of our own making threaten life at the local and regional levels. These risks accumulate, and yet we have barely begun to manage them. Still another threat to the Earth's environment derives from the possibility of nuclear war - from the arms race and its spread to outer space. The search for a more viable future can only acquire meaning in the context of a more vigorous effort to eliminate and renounce the development of means of mass annihilation.

5. Although the dangers before us are great, so is the promise. Our prosperity and progress have always depended on our technical ingenuity and our capacity for cooperative action. These qualities have often been used constructively to correct developmental and environmental failures. Air and water pollution have been controlled and reversed in many areas. The efficiency of material and energy use has increased. Many poor countries have increased food production and reduced population growth rates. Some technological advances, particularly in

medicine, have been more widely shared: Smallpox has been eliminated and the incidence of several other infectious diseases has been reduced, leading to a decline in mortality rates and an increase in life expectancy. Above all, there has been a change in attitudes - a greater sense of environmental responsibility and a growing appreciation of the links between economics and ecology. The real task before us is to take much more positive steps so that we can retrieve our future from the prospect of political conflict, economic disruption, and ecological decline.

#### I. THE CURRENT CRISIS

6. The environmental difficulties that confront us are not new, but only recently have we begun to understand them in all their complexity. They were brought into sharper focus in the 1980s by the ecological roots of the food emergencies in Africa; the impact of acid rain in Europe and North America; the accidents at Bhopal, Chernobyl, and elsewhere; the discovery of large holes in the ozone layer above the poles; and a host of other events. The symptoms of today's economic crisis can be seen in declining growth rates in virtually all parts of the world other than South and East Asia, increasing inflation rates in Latin America and Africa, rising unemployment in developed market economies, a fall in the rate of expansion of world trade, the debt crisis, and unstable international financial markets.

7. The slowdown in the momentum of economic expansion and the stagnation in world trade have posed major problems of adjustment for all countries. Primary product exporters from developing countries have been hit particularly hard by falling commodity prices. According

to UNCTAD estimates, developing countries suffered a loss in export earnings between 1980 and 1984 of about \$55 billion because of the fall in commodity prices, a blow felt most in Latin America and Africa.<sup>1/</sup>

8. Widening balance-of-payments deficits could only be covered by greatly enhanced borrowings from commercial lenders in the main financial markets. A combination of rising interest rates, changes in exchange values, and worsening terms of trade made it difficult for several developing countries to service their foreign debt and led to what has been called the debt crisis. In many, natural resources have been overexploited to meet the higher burden of debt service. Pressures from international lenders have also led to austerity measures that compounded the problems of low growth and hit social programme expenditures hardest.

9. Declining growth rates, falling commodity prices, and the debt crisis have had particularly severe consequences for the Third World, and the burden of adjustment there has fallen disproportionately on the poor. In many countries, particularly in Africa, the situation has been worsened by exceptionally poor weather conditions. The international response to this exacerbation of poverty and related problems has focused primarily on emergency assistance. Measures designed to deal with the deeper structural features of the crisis have received far too little support and, in fact, development cooperation has declined. Concessional aid has stagnated, negotiations on critical development issues have been stalled, protectionism has increased greatly in developed market economies, multilateral institutions and arrangements have been devalued, and the notion of an international responsibility for development has virtually disappeared.

How long can we go on and safely pretend that the environment is not the economy, is not health, is not the prerequisite to development, is not recreation? Is it realistic to see ourselves as managers of an entity out there called the environment, extraneous to us, an alternative to the economy, too expensive a value to protect in difficult economic times? When we organize ourselves starting from this premise, we do so with dangerous consequences to our economy, health, and industrial growth.

We are now just beginning to realize that we must find an alternative to our ingrained behaviour of burdening future generations resulting from our misplaced belief that there is a choice between economy and the environment. That choice, in the long term, turns out to be an illusion with awesome consequences for humanity.

Charles Caccia, MP  
Former Minister of  
Environment, Government  
of Canada  
WCED Public Hearing  
Ottawa, 26-27 May 1986

10. The symptoms of economic crisis linked to environmental stress are most evident in sub-Saharan Africa, where per capita income declined in most countries during the 1980s. Per capita food production, which has been declining since the early 1960s, fell precipitously. The prolonged drought in the Sahel threatens to turn what was once savannah into desert. In sub-Saharan Africa, more than anywhere else, present trends point inexorably to a massive tragedy unless long-term countermeasures are initiated immediately.

11. But Latin America, too, has faced an economic crisis evidenced by falling per capita incomes, by accelerating inflation, and most obviously by the crippling burden of foreign debt. The price of maintaining debt service has been a sharp increase in poverty and more intense exploitation of natural resources - both with severe negative environmental effects. In other parts of the Third World, falling commodity prices, including for oil,



have aggravated economic distress and pressured nations to deplete scarce natural resources.

12. South and East Asia are the only parts of the developing world where the momentum of development could be maintained during the 1980s. In the two largest nations, China and India, growth rates have accelerated.<sup>2/</sup> A striking feature of this region's experience is the steady increase in food production, a rapid expansion in indigenous manufacturing capabilities, and effective macroeconomic policies to contain inflation and foreign exchange imbalances. But the heavily populated countries of the region are operating much closer to the limits of their resource of arable land and water, and the 1980s saw growing concern about the environmental problems posed by deforestation, soil erosion, salinization, urban congestion, and industrial pollution and about the economic costs that these induce.

13. Developed market economies experienced a deep recession in the early 1980s, which was only one manifestation of the weakness in growth patterns in these countries. A more difficult problem lies in the ecological consequences of these growth patterns, which are now a major cause for concern. The impact of acidification on forests and lakes, the ecological effects of agriculture support policies, and the high risks of nuclear power development are some of the crucial areas of concern.

14. What we have seen in recent years is not just a cyclical fluctuation in the growth process. It is a deeper crisis attributable to a variety of conditions that have held for a long time:

- \* Neglected ecological considerations led to unsustainable pressures on land and water resources that, in Africa, resulted in a serious food emergency.
- \* The processes of savings and accumulation were interrupted and led to unsustainable levels of foreign borrowing.
- \* The impact of these two conditions has been aggravated by rising interest rates, falling commodity prices, and the general decline in development cooperation.
- \* Most developing countries do not as yet have the economic, organizational, and technical flexibility that would make them less vulnerable to crises.
- \* In many countries, social tensions have increased because of the coexistence of poverty and a new consumer-oriented middle class.
- \* The relative neglect of the social and cultural dimensions of development has wasted human resources.

## II. THE DEVELOPMENT CONNECTION

15. Since the mid-1950s, the growth process has spread to most parts of the world, and developing countries as a whole have grown a little more rapidly than developed market economies. Yet the large difference in the base level meant the development gap between countries persists and in some respect has even widened. Income gaps are conventionally measured by the per capita gross national

TABLE 1-1			
Population Size and Per Capita GNP by Groups of Countries			
Countries	Population	Per capita GNP	Average annual growth rate of per capita GNP, 1965-84
	(million)	(1984 dollars)	(per cent)
Low-income Economies (excluding China and India)	611	190	0.9
China and India	1,778	290	3.3
Lower Middle-income Economies	691	740	3.0
Upper Middle-income Economies	497	1,950	3.3
High-income Oil Exporters	19	11,250	3.2
Industrial Market Economies	733	11,430	2.4

Source: World Bank. World Development Report 1986 (Oxford: Oxford University Press, 1986).

product (GNP), which according to World Bank estimates ranged in 1984 from \$190 in low-income countries (other than China and India) to \$11,430 in the industrial market economies (see Table 1-1).<sup>3/</sup>

16. Widely different GNP levels are not the whole story. What is as important is the fact that 30 per cent of the gross domestic product in developing countries still arises from primary production in agriculture and mining whereas the corresponding figure is only 7 per cent for the developed market economies, a difference reflected in their relative positions in international trade.<sup>4/</sup> This high dependence on primary production amplifies the economic impact of ecological stress. Vast gaps exist also in productivity, in the capacity for technology development and utilization, and in roles in the world financial system.

17. The nature of the economic interaction between the developed and developing countries has changed in recent years because of the growth in financial power of some oil

exporters, the rapid rise in manufactured exports from some developing countries, and the growing importance of some of these countries for world money markets. Yet the number of nations and people affected by these basic changes is still limited. Most people in the Third World still live in poor countries with one or more of the following characteristics: a high degree of dependence on agriculture, and hence, on the ecological base of land, water, and forests; foreign exchange earnings based primarily on exports of primary commodities; a continuing need for international financial and technical assistance; and a limited potential for autonomous technical development.

18. The development gap matters because it is linked to the pressure on resources and environmental stresses. Population growth has been and continues to be a source of developmental and environmental stress in many developing countries. But the greater part of the pressure on global resources has come from residents of developed countries, who at present consume perhaps four-fifths or more of the world's non-renewable resources of minerals and fossil fuels.<sup>5/</sup> Even when it comes to food, developed countries' share in total consumption is high relative to their share in world population (see Table 1-2). Similar pressures arise from the consumption patterns of the rich in developing countries. Generally, at the global level the demands arising from affluence have been a greater source of resource and environmental stress than those arising from the size of population.

19. The root of the problem lies in the life-styles promoted and served by economic growth. Even in the case of agriculture, the rising demand for staple foodgrains is not the only stress on resources. The growing demand for food items like milk and meat is as important. Their production requires the maintenance of a livestock

Table 1-2					
Distribution of World Consumption, Averages for 1980-82					
Commodity	Units of Per Capita Consumption	Developed Countries (26 per cent of population)		Developing Countries (74 per cent of population)	
		Share in World Consumption	Per Capita	Share in World Consumption	Per Capita
		(per cent)		(per cent)	
Food					
Calories	Kcal/per day	34	3,395	66	2,389
Protein	gms/per day	38	99	62	58
Fat	gms/per day	53	127	47	40
Paper	kg/per year	85	123	15	8
Steel	kg/per year	79	455	21	43
Other Metals	kg/per year	86	26	14	2
Commercial Energy	mtce/per year	80	5.8	20	0.5

Source: WCED estimates based on country-level data from FAO, UN Statistical Office, UNCTAD, and American Metal Association.

population so large that its combined biomass is well in excess of that of human beings.<sup>6/</sup> Although the feed energy required to maintain these animals and to produce milk and meat has largely consisted of forage, feedgrain requirements also increased, and in total these products require much more land than staple foodgrains do.<sup>7/</sup>

20. The impact of rising affluence can also be seen in products like automobiles, electricity, and chemicals, which have been the crucial elements in the rising standards of living in North America, Europe, and Japan. All these products are resource-intensive and their manufacture entails substantial pollution. Hence the expansion of the industrial economies meant a considerable increase in the demand for non-renewable resources and raised certain questions about resource depletion, one of the earliest of environmental concerns to attract widespread public attention. Many global, regional, and national pollution problems are linked to this material and energy-intensive life-style. The content of growth in

these economies has recently changed, with a greater emphasis on informatics, electronics, and service sectors that are not as resource-intensive. Yet changing consumption patterns in some developing countries, particularly in cities, and in socialist countries are rapidly raising material and energy requirements in these areas.

21. Economic and environmental problems of many developing countries, particularly in Latin America, arise from a style of development that is closely linked to growth patterns in industrial markets. The economies of these countries are in effect transnationalized in various ways. First, a transnationalization of life-styles has occurred, particularly of the rich, whose consumption demands use up an inordinately high proportion of national resources. Second, technological patterns have been homogenized in a way that often leads to ecologically and economically inappropriate techniques and organizational arrangements. Third, a substantial part of economic activity becomes tied to demand growth in developed countries. And fourth, a substantial part of the national economy comes under the control of transnational corporations.

22. Where these forces operate, market pressures exerted by the rich can lead to intensified commercialization in the poorer countries. This is not always undesirable, but in certain cases it can have an adverse impact on the environment. These pressures also increase the vulnerability of these economies to fluctuating and, in some cases, declining terms of trade, as has been well documented; less substantiated is the more recent trend towards intensified primary product productions for export that has been brought about by acute foreign exchange scarcity. Commercialization in agriculture often leads to inappropriate cropping patterns and practices; for

The remarkable achievements of the celebrated Industrial Revolution are now beginning seriously to be questioned principally because the environment was not considered at the time. It was felt that the sky was so vast and clear nothing could ever change its colour, our rivers so big and their water so plentiful that no amount of human activity could ever change their quality, and there were trees and natural forests so plentiful that we will never finish them. After all, they grow again.

Today we should know better. The alarming rate at which the Earth's surface is being denuded of its natural vegetative cover seems to indicate that the world may soon become devoid of trees through clearing for human developments.

Hon. Victoria Chitepo  
Minister of Natural  
Resources and Tourism,  
Government of Zimbabwe  
WCED Opening Ceremony  
Harare, 18 September 1986

example, sugar cane might be cultivated in areas where the water is better used for other crops. It also leads to more intensive use of land with a reduction in fallow periods, the loss of crop rotation patterns that maintain the binding capacity of the soil, greater applications of fertilizers and pesticides, and inappropriate water use. All of this leads ultimately to a loss in productivity and decline in the economic base for development.

23. Commercialization is also tied to the serious environmental problem of deforestation, a part of which results from cattle ranching: Worldwide this accounts for around 2 million hectares of forest loss a year.<sup>8/</sup> One push behind this forest conversion has been the need for cheaper sources of beef to meet the U.S. demand for fast foods. The rising demand for tropical timber has also led many countries with large forest resources to overemphasize the timber harvest.

24. Subsistence farmers have been most marginalized, or pushed out of the mainstream of economic activity, where demographic pressures have combined with growing demands for the commercial use of the better land, often for exports. Where they have been forced to make greater use of forest areas, the cycle of shifting cultivation has shortened so much that forests are being destroyed. In many dry areas cultivation is being extended to marginal lands on steep slopes, with increasing risks of soil erosion. In many river valleys, areas chronically liable to floods are now farmed. The entire complex of environmental problems in these countries is linked to their marginal position in the world economy and the lack of a domestic base for diversified development.

25. Poverty and environmental pressures lead to catastrophes because of the economic vulnerability of many poor countries. Little room is available to cope with natural disasters like droughts or floods; what in a richer country could be managed with food or foreign exchange reserves becomes, in poorer nations, an unmanageable emergency. Vulnerability is also reflected in an inability to persist with sound long-term policies in the face of such natural disasters or short-term economic fluctuations. Thus, quick gains in food production or of exportable crops and minerals are sought even at the cost of long-term environmental damage.

26. Many developing countries are not caught in this tangled web, however. They have managed to raise food production substantially, to diversify their economies by increasing industrial output and exports, and to raise living standards. But even in these countries, long-term environmental and developmental needs have often been sacrificed for short-term gains. Irrigation, for instance, has been a major contributor to agricultural



prosperity, but a large number of irrigation schemes face problems of salinization, alkalization, and waterlogging. In many irrigated areas, excessive groundwater withdrawals have lowered water-tables. Attempts to compensate for declining land productivity often involve increased applications of fertilizers, which has led in some areas to nitrate pollution of water bodies.

27. The growing dependence on a single crop, often a single seed variety, has increased the potential loss from pest attacks in some areas and led to a greater use of pesticides, with the attendant problems of pest resistance and pesticide poisoning. In industry, a rapid expansion in production has led to extensive pollution and exposure to hazards. The resulting damages to human health and well-being and to economic productivity could have been avoided. Most important, the concentration on directly productive investments and the diversion of resources to sustain industrial country life-styles for a small part of the population entailed a relative neglect of water supply, sanitation, urban amenities, and similar services - thus worsening the quality of life, particularly in cities.

28. Environmental consequences of these patterns of development can be seen in virtually every part of the world. The evidence of stress is accumulating - stress that arises from poverty on one hand and overconsumption by the rich on the other. The demands of the latter lead to rising production but in a manner that erodes resources and thus endangers the very basis for the increased production. Moreover, the process works in such a way that although the requirements of the affluent are met, the livelihood base of many poor producers is destroyed or severely reduced, and this in turn further pressures the resource base. As we cross certain thresholds, the risks will increase and the ecological consequences of

inappropriate development will not only undermine the possibility of development but endanger life-support systems themselves.

### III. THE MOUNTING RISKS

29. The growth and development of human societies has always required intervention in the operation of natural systems. The difference today is that the scale and complexity of these interventions has increased greatly with the rising level of production and resource use. In many natural processes thresholds exist that cannot be crossed without endangering the basic integrity of the process. Today we are close to many of these thresholds and run the risk of endangering the survival of life on Earth. Moreover, the speed with which changes in resource use are taking place shortens greatly the time available to anticipate and prevent unexpected effects.

30. Threats to life-support systems can be seen in a variety of environmental problems. One of the most dramatic examples concerns the accumulation of "greenhouse gases" in the atmosphere. Upon combustion, fossil fuels emit carbon dioxide, which accumulates in the atmosphere and absorbs longer wavelength radiation that would otherwise move out of the atmosphere, hence acting like a greenhouse. The cutting and burning of forests adds to this carbon dioxide load. The preindustrial concentration was 280 parts of carbon dioxide per million parts of air (by volume - ppmv). This concentration reached 340 ppmv in 1980 and is expected to increase to 560 ppmv between the middle and the end of the next century.<sup>9/</sup>

31. Carbon dioxide buildup has already led to a significant rise in the average global temperature. Forecasts of further increases indicate that a global  
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I am here as the son of a small nation, the Krenak Indian Nation. We live in the valley of the Rio Doce, which is the frontier of Espirito Santo with the State of Minas Gerais. We are a micro-country - a micro-nation.

When the government took our land in the valley of Rio Doce, they wanted to give us another place somewhere else. But the State, the government will never understand that we do not have another place to go.

The only possible place for the Krenak people to live and to re-establish our existence, to speak to our Gods, to speak to our nature, to weave our lives is where our God created us. It is useless for the government to put us in a very beautiful place, in a very good place with a lot of hunting and a lot of fish. The Krenak people, we continue dying and we die insisting that there is only one place for us to live.

My heart does not become happy to see humanity's incapacity. I have no pleasure at all to come here and make these statements. We can no longer see the planet that we live upon as if it were a chess board where people just move things around. We cannot consider the planet as something isolated from the cosmic.

We are not idiots to believe that there is possibility of life for us outside of where the origin of our life is. Respect our place of living, do not degrade our living condition, respect this life. We have no arms to cause pressure, the only thing we have is the right to cry for our dignity and the need to live in our land.

Ailton Krenak  
Co-ordinator of Indian  
Nations Union  
WCED Public Hearing  
Sao Paulo, 28-29 Oct 1985

warming of 1.5-4.5 degrees Celsius should be anticipated over the next 45 years. This could cause sea level rises of 25-145 centimetres, enough to inundate many low-lying coastal cities and large areas in river deltas. Indeed, the impact on climate and marine ecosystems could cause problems in all agricultural areas. Thus the accumulation of greenhouse gases could threaten the very basis of survival in many areas.<sup>10/</sup>

32. A similar threat to the Earth's life-support systems arises from the depletion of the ozone layer by gases released during the production of foam, refrigerants, and

aerosols. A substantial depletion in the ozone layer could have catastrophic effects on human health and on certain forms of life that lie at the base of the marine food chain. The recent discovery of a hole in the ozone layer above the Antarctic indicates the possibilities of a more rapid depletion than previously suspected. It is not yet clear whether this hole is a temporary climatic anomaly or the effects of pollution.<sup>11/</sup> Nevertheless, the likely effects of ozone depletion are such that this recent discovery is major grounds for concern.

33. At regional scale acidification poses a major ecological threat in Europe. The transport over long distances of a variety of air pollutants is leading to the acidification of the environment, sometimes thousands of miles from the point of emission. Acidification has a very direct impact on productive resources. Several thousand lakes in Europe and North America have registered steady decreases in acidity levels to the point where they no longer support fish life.<sup>12/</sup> The same acids attack stonework and corrode metal structures causing billions in damage annually. They enter drinking water supplies; liberate from the soil potentially toxic metals such as cadmium, lead, mercury, zinc, copper and aluminium; and poses risks to human health.

34. Up to now, the greatest damage has been reported over Eastern and Western Europe, which are currently receiving more than one gramme of sulphur on every square metre of ground each year. Little tree damage was evident in Europe in 1970, but as of 1985 an estimated 5-6 per cent of all European forest land is affected.<sup>13/</sup> Evidence of acidification in some newly industrializing developing countries is now beginning to emerge.<sup>14/</sup> The impact of this on forests and, as a result, on erosion, siltation, flooding, and local climatic change could be disastrous.

35. Desertification and large-scale deforestation provide other examples of regional ecological threats. The processes of desertification are complex and depend as much on weather fluctuations as on agricultural practices. Nevertheless, the pressures of subsistence food production, commercial crops, and meat production in arid and semi-arid areas have contributed to this process. Some 29 per cent of the Earth's land area is subject to varying degrees of desertification - slight, moderate, or severe - and an additional 6 per cent is classified as extremely severe. The area degraded to desert-like conditions continues to grow at an annual rate of 6 million hectares.<sup>15/</sup> As for forests, every year over 11 million hectares are destroyed, mostly in tropical areas.<sup>16/</sup> Apart from the direct impact in desertified or deforested areas, regions nearby are affected by the spreading of sands or by changes in hydrological regimes and increased risks of soil erosion and siltation. The impact on local climate is uncertain but, at least in the case of deforestation, local and regional effects are presumed to be substantial.

36. A special class of risks arises from the reduction of genetic diversity in the world's ecosystems. In settled agriculture this is reflected in the relative uniformity of the genetic base of the seed varieties, planting materials, and breeding stocks used in modern high-yield agriculture. This narrowing of the genetic base can amplify greatly the effects of weather stress, pest attacks, and plant disease, and it increases considerably the risks of large-scale losses. In natural systems the loss of genetic diversity arises from the loss of habitats, particularly in tropical forests, which harbour 40-50 per cent of all plant and animal species.<sup>17/</sup> These species are important for

agricultural research and for the production of many manufactured goods.

37. Local risks can have serious implications for those immediately affected. An example is the problem of toxic waste, particularly in the chemical industry. In many cases wastes are transported to distant sites for disposal, often across borders. The disposal of toxic wastes in seas and rivers also aggravates a more general problem of water pollution. Agricultural run-offs laden with fertilizers and pesticides have compounded this problem. The pollution of water bodies leads not merely to a loss of amenities but also to health damage, loss of fishing resources, and reduced irrigation potential.

38. Toxic radioactive wastes that will remain lethal for centuries, another concern at the local level, are an outgrowth of the development of nuclear technology, for both military and peaceful uses. Indeed, the arsenal of nuclear weapons in the hands of a few powers is large enough to destroy all life on earth and involves an unacceptable risk of accidental tragedy. In its peaceful uses, nuclear technology still poses the risks of large-scale radiation damage in the event of an accident.

39. The ecological risks that confront us have their roots in the rapid rise in production and resource use and in the orientation of technological development. Over the past century the use of fossil fuels has grown nearly thirtyfold and industrial production more than fiftyfold. The bulk of this increase, about three-quarters in the case of fossil fuels and a little more than four-fifths in the case of industrial production, has taken place after 1950.<sup>18/</sup> The annual increase in industrial production today is perhaps as large as the total production in Europe around the end of the 1930s. Thus, every year we

If people destroy vegetation in order to get land, food, fodder, fuel, or timber, the soil is no longer protected. Rain creates surface runoff, and the soil erodes. When the soil is gone, no water is retained and the land can no longer produce enough food, fodder, fuel, or timber, so people need to turn to new land and start the process all over again.

All major disaster problems in the Third World are essentially unsolved development problems. Disaster prevention is thus primarily an aspect of development, and this must be a development which takes place within the sustainable limits.

Odd Grann  
Secretary General,  
Norwegian Red Cross  
WCED Public Hearing  
Oslo, 24-25 June 1985

have to recreate the decades of adaptation and development that formed the basis of the pre-war European economy.

40. Environmental risks are also being generated in more traditional areas of productive activity. More land has been cleared for settled cultivation in the past century than in all the previous centuries of human existence. Our interventions in the hydrological cycle have increased greatly. In Europe and Asia, water use has reached 10 per cent of the annual run-off, a figure that is expected to rise to 20-25 per cent by the end of the century.<sup>19/</sup> At this scale, human intervention in the hydrological cycle is no longer marginal and can lead to unexpected ecological problems.

41. The risks arising from the growing scale of economic activity have been compounded by the narrowness of objectives in technological developments. New products and processes are introduced largely to increase the productivity of some scarce resource with little regard

for their impact on all the resources that constitute the environment. Technological risks have been added to the many natural risks to which human societies are subject. Thus the disruptive effects of accidents have increased greatly with the growing size of industrial plants. New chemicals have been introduced into the market without adequate knowledge about side-effects and long-term consequences. New life-forms are soon likely to be introduced without an adequate understanding of the wider ecological impact.

42. Further, the growth of modern industry is based on technologies that involve large interventions in nature, and in recent decades the scale of these interventions is increasing. Massive dams, most of which were built after 1950, impound a large proportion of the river flow. Huge open-cast mining projects gouge up thousands of hectares of earth and generate waste material in terms of millions of tonnes. As industrial facilities become larger, the emission of pollutants into the atmosphere and into water bodies also becomes concentrated.

43. The risks stemming from our productive activity and the technologies we use impinge not just on the beneficiaries of that activity but on others. Many of these risks are inherently transnational or global in character. The activities that give rise to these risks are concentrated, to a large extent, in the more prosperous countries. But the risks are shared by all, rich and poor. Even more crucial is the fact that most who share in these risks have little influence on the decision processes that regulate the activities leading to the risks. The life-support systems of the Earth are shared by all living creatures, and all that impinges on them must be a matter for common concern.



#### IV. GROWTH OF PUBLIC CONCERN

44. Human have always been conscious of their physical environment and the limitations it imposes. This awareness has changed over time with the growth of scientific knowledge and the development of technologies for the use of natural resources and the control of natural processes. Today, a great deal of economic and technological activity seems to be conducted on the assumption that we know enough to be able to manage and manipulate the constraints imposed by nature. The environment movement in its modern form is essentially a corrective to this implicit assumption.

45. Concern for environmental problems has been articulated in international discussions for some time now. In the early stages the focus was on pollution and resource depletion problems that arise from rapid growth. Much of the initial interest was in the notion of limits to growth set by resource constraints, and it seemed to suggest that the solution to environmental problems lay in a reduction in economic growth rates. This was manifestly not the case in developing countries, where more often than not environmental problems arose from a lack of economic growth rather than from too much of it. During the early 1970s a series of international statements recognized this clearly and shifted the focus of environmental debate from developed to developing countries.

46. The 1972 United Nations Conference on Human Environment held in Stockholm provided a focal point for the articulation of environmental concerns. An important preparatory event was the Seminar on Development and

Environment, held at Founex, Switzerland, in June 1971, which drew a clear link between environmental concerns and developmental problems.<sup>20/</sup> The concept of "ecodevelopment", a process of positive management of the environment for human benefit, helped to bridge a gap between the environmental concerns of developed and developing countries. The concept moved further in the notion of "development without destruction" articulated in the Cocoyoc Declaration that emerged from a seminar organized by UNEP/UNCTAD in 1974, and then in the objective of "conservation for development" that underlies the World Conservation Strategy formulated by IUCN in 1980.<sup>21/</sup>

47. Growing awareness of environmental issues led to many institutional and policy initiatives. At the international level, the United Nations Environment Programme was set up to implement the Stockholm Action Plan and to play a catalytic role in stimulating appropriate efforts in national and international organizations. At the time of the Stockholm Conference, 25 countries had environmental management agencies; today such agencies exist in more than 140 countries.<sup>22/</sup> A spate of national legislation on environmental matters has been enacted and several important international conventions have been signed. The effectiveness of many of these initiatives is still open to question, and the environmental bases for development continue to deteriorate the world over. The various measures do demonstrate a growing concern about environmental issues in official circles at the national and international level, but their limited impact also demonstrates that most current approaches to environment and development are not working satisfactorily.

Today, due to the global threats, created by irrational policies supported and fostered by the economic power, citizens are organizing themselves to influence at the decision making levels, in a desperate effort to save the habitat of the great majorities and to protect the human rights of the poorest. As long as inequalities, imbalances persist, there is no possibility, no hope for sustainable development.

Citizen participation at decision-making levels is one of the fundamental prerequisites for any sustainable development. A new division of powers among the actors of the development process is needed, at the individual and collective national and international level.

Independent citizens have a most important role to play in this struggle, but it must be stressed that isolated efforts of individuals or groups will be lost, their achievements will be annihilated in our transnationalized world, as long as citizens fail in organizing themselves to become a political force and an active partner at the development process.

Magda Renner  
ADFG - Amigos da Terra  
WCED Public Hearing  
Sao Paulo, 28-29 Oct 1985

48. One striking feature of the 1970s and 1980s has been the growth of public concern about environmental issues, reflected in the spread of activist groups in every part of the world. As many as \_\_\_\_\_ non-governmental organizations (NGOs) from \_\_\_\_\_ countries testified before the Commission in public hearings, and many more like them exist all over the world. The Environment Liaison Centre in Nairobi is in touch with some 7,000 NGOs whose primary objective is environmentally related development work or communications.<sup>23/</sup>

49. The growing strength and prestige of NGOs reflects the rising importance of environmental issues in political and social consciousness and, equally, a belief that these issues are not receiving the attention they deserve in

national and international decisions. In some areas this has progressed to a stage where environmentally oriented political parties are a considerable force. Today a public commitment to environmental protection and enhancement is a common feature of most, if not all, political platforms.

50. Public concern for environmental issues has, in many cases, led to a public response in the form of changed behaviour. Witness, for instance, the growing use of unleaded gasoline and catalytic converters, successful glass and paper recycling programmes in some countries, and the changes in dietary habits in some affluent societies. Mass movements for forest protection and resistance to indiscriminate irrigation exist in some developing countries. In fact, most traditional societies have built-in codes of behaviour that recognize the critical importance of environmental protection. The difficulty often lies in the powerlessness of these groups and their codes against the narrower commercial objectives of other interest groups. Yet they provide a basis for a changed system of values in both developed and developing countries. The real challenge is to ensure that these new values, with their emphasis on environmental protection and harmony with nature, are more adequately reflected in the values that govern political and economic structure.

51. Hearings conducted by this Commission in five continents provided a forum for the articulation of public concern. We heard from national and international official agencies, scientists and experts, non-governmental organizations, and, most important, from ordinary people directly affected by developmental and environmental failures. During site visits, the Commission has seen the physical evidence of these failures and heard the views of local people. It has also seen that much can be done to correct these failures.

52. These hearings demonstrated that environmental problems are increasingly seen to be linked to a broader class of developmental problems and vice versa. First, many environmental problems are seen to be the result of maldevelopment (e.g., the link between air pollution and misconceived energy policies) or lack of development (e.g., the impact of stagnation in food production on land requirements for a growing population). Second, the genesis of some problems is seen to lie in inequalities between and within nations (e.g., the deterioration in the habitat of indigenous people in some developed countries or the impact of metropolitan demands on deforestation and desertification). Third, the solution to many environmental problems is seen as incomplete unless the developmental problem of sustainable livelihood is simultaneously solved (e.g., the futility of forest conservation measures in the absence of steps to safeguard the livelihood of forest dwellers).

53. A great deal has been achieved by the policy and institutional initiatives on environmental matters taken by national and international agencies during the last 15 years. But these initiatives are not enough, and the usual approach to environmental problems as conventionally defined is inadequate. If we are to anticipate events, address ourselves to causes, and look for lasting solutions, environmental and developmental problems have to be integrated and recast into a new framework that tackles them at the same time. Moreover, because of growing interdependence, the solutions will require actions that cut across sectoral and political boundaries, as well as a new approach to international cooperation and national decision making.

## V. RETRIEVING THE FUTURE

54. The first and most urgent task before the world community is to manage the risks that threaten the survival and well-being of some or all of the human community. This imperative includes the need to avoid nuclear war and to respect the "outer limits" of the processes that affect the Earth's principal life-support systems.

55. As indicated earlier in this chapter, current threats to critical life-support systems have arisen from a variety of factors, the more important of which are:

- \* changes in the composition of the atmosphere that could lead to a global warming and a reduction in the ozone layer,
- \* the long-range transport of air pollutants,
- \* large-scale destruction of forests and genetic resources,
- \* desertification and soil erosion,
- \* the accumulation of hazardous wastes,
- \* severe contamination of oceans and water bodies, and
- \* contamination of the food chain.

56. None of these threats is deliberate nor do they all pose the same degree of immediate risk. But all can be mitigated by cooperative action directed not just at the effects that we observe but at the causes of these effects. It is our duty to future generations to ensure that these risks to life-support systems at the local, national, and global level are contained and reduced.

In situations of scarce resources, it is no surprise that governments tend to deal more with problems of hunger and starvation, which admittedly are the results of environmental degradation. It is however urgent that Africa address itself to the real causes of its social and economic problems, some of which are deeply rooted in environmental degradation.

Rt. Hon. Robert Mugabe  
Prime Minister of  
Zimbabwe  
WCED Opening Ceremony  
Harare, 18 September 1986

57. Mere survival is not enough. The quality of life is as important. The most urgent task here is to accelerate the processes of development and raise living standards in developing countries. This will necessarily require a recovery from the economic stagnation of recent years and a revival of the growth process in the world economy.

58. A revival of growth based on largely on past patterns is not viable. Yet the problems of poverty and underdevelopment cannot be solved unless we have a new era of growth centred largely on the developing countries. This will necessarily increase environmental impacts and pressures on resources. Hence growth must be based on objectives and methods that recognize this and ensure that the economic, ecological, and social bases for development allow growth to be sustained without running into crises of ecological destruction, stagnation, or economic decline.

59. It is now increasingly clear that the new approach to growth and development cannot be pursued by any nation in isolation. The geographical scale of ecological influences is such that factors such as transboundary pollution or overexploitation of shared resources increase greatly the impact of every nation on the ecosystems of

others. The widening of economic ties through trade and finance accentuates this interdependence. Therefore many of the changes needed will require regional and international cooperation. A purely nationalistic approach to development and environment is no longer feasible.

60. It is also clear that the roots of many developmental failures lie in the neglect of environmental factors in the design of projects, programmes, policies, and plans. By the same token, many efforts at environmental improvement fail because they were not integrated with developmental activities. The solution to many such problems requires the recognition of this complex interaction. And the answers must be found not in technical fixes but in more basic changes in the orientation of all sectoral and economic policies.

61. The world must now aim at a new type of development that integrates increases in production with resource conservation and enhancement, and that links both to the provision of an adequate livelihood base and equitable access to resources. This is the most urgent task before us today.