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DRAFT EXECUTIVE STATEMENT

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## EXECUTIVE STATEMENT

Humans have thrived as a species and come to dominate this planet largely due to their abilities to plan ahead and to work together for common goals. As technology shrinks the planet by lengthening human reach and as human numbers, needs and wants increase, humankind's survival will depend on ever more effective anticipation and co-operation.

This Commission believes that people have the power to prevail - to build a future that is more prosperous, more just and more secure. New technologies to improve and increase our powers to communicate, forecast and plan are available. The Commission's Report is not a prediction of ever increasing poverty, hunger and hardship in an ever dirtier world among ever decreasing resources. It sees instead the possibility of economic growth based on policies which sustain and expand the environmental resource base; and it believes that such growth to be absolutely essential to relieve the great poverty which still exists in much of the developing world.

But the Commission's hope is conditional on political action now to begin managing environmental resources to ensure not only sustainable human progress but the survival of human life on earth. There is no such thing as a 'long-term decision'; all decisions are taken in the present, though they may have impacts over the long term. Instead of forecasting a future, the Commission is serving a notice - an urgent notice based on the latest and best scientific evidence - that the time has come to take the decisions needed to secure the resources to sustain this and coming generations. [Box 1]

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BOX 1:

The World Commission on Environment and Development first met in October, 1984, and published its Report 900 days later in April, 1986. Over those few days:

- \* The environmental crisis in Africa peaked, putting 35 million people at risk, killing perhaps a million.
  - \* A leak from a pesticides factory in Bhopal, India, killed 2,000 people and blinded and injured thousands more.
  - \* Liquid gas tanks exploded in Mexico City, killing 1,000 and leaving thousands more homeless.
  - \* The Chernobyl nuclear reactor explosion sent nuclear fallout across Europe, damaging agricultural produce and threatening future human cancers.
  - \* Agricultural chemicals, solvents and mercury flowed into the Rhine River during a warehouse fire in Switzerland, killing millions of fish and threatening drinking water in West Germany and the Netherlands.
  - \* Institutions tested genetically-altered, living viral vaccines in other countries, in one case without notifying the government in the country where the test was conducted.
  - \* An estimated 60 million people died of diarrhoeal diseases related to unsafe drinking water and malnutrition; most of the victims were children.
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## I. THE GLOBAL CHALLENGE

### Successes and Failures

Those looking for success and signs of hope can find many: infant mortality is falling; human life expectancy is increasing; the proportion of the world's adults who can read and write is climbing; the proportion of children starting school is rising; birth rates are falling everywhere but in sub-Saharan Africa. On a global scale, food production increases globally faster than the population grows.

But these gains are offset by trends which the planet and its people cannot long bear. These have traditionally been divided into failures of 'development' and failures in the management of our human environment. On the development side, there are more hungry people in the world than ever before, and their numbers are increasing. So are the numbers who cannot read or write, the numbers without safe water or safe and sound homes, the numbers short of woodfuel with which to cook and warm themselves. The gap between rich and poor nations is widening - not shrinking - and there is little or no reasonable hope, given present trends and institutional arrangements, that this process will be reversed.

There are also environmental trends that threaten to radically change our planet, that threaten the lives of many species upon it, human and others. An area of productive dryland almost as large as Ireland turns each year into worthless, unsalvageable desert. An area of tropical moist forest the size of Iceland, and the genetic resources contained therein, is eliminated each year; much of it is converted to low-grade farmland unable to support the farmers who settle it. In Europe and North America, acid pollution kills forests and lakes and damages the artistic and architectural heritage of nations; it may have acidified vast tracts of soil beyond reasonable hope of repair. The burning of fossil fuels puts

into the atmosphere carbon dioxide which is warming the atmosphere. This 'greenhouse effect' may by early next century have increased average global temperatures enough to shift agricultural production areas, disrupt national economies, and raise sea levels to flood coastal cities. Other industrial gases threaten to deplete the planet's protective ozone shield to such an extent that the number of human and animal cancers would rise sharply and the oceans food chain would be disrupted. Industry and agriculture put toxic substances into the human food chain and into underground water tables beyond reach of cleansing.

In the early 1980s, many in national governments and multilateral institutions looked at these trends and mounting risks and realised that they were inextricably linked one to another. They saw that it was impossible to separate economic development issues from environment issues, as many forms of development erode the environmental resources upon which it must be based, and environmental degradation makes economic development impossible. They further realised that the world's major institutions as presently constituted show little promise of being able to change these basic trends. They saw poverty as both a major cause and effect of global environmental problems. And they saw the futility of attempting to deal with environmental problems without a broader perspective, one which encompassed the factors underlying world poverty and international inequality.

These concerns were behind the establishment in 1983 of the World Commission on Environment and Development, an independent body, linked to but outside of government and UN systems. The Commission's mandate gave it three objectives: to re-examine the critical environment and development issues and to formulate realistic proposals for dealing with them; to propose new forms of international cooperation on these issues that will influence policies and events in the direction of needed changes; and to raise the levels of understanding and commitment to action of individuals, voluntary organisations, businesses, institutes and governments.

Through its own deliberations and through the testimony of people at public hearings it held in five continents, the Commission came to realise that the very word 'development' was becoming debased when used in its narrow technical sense of improving the economic indicators of 'developing' nations. 'Development' is meaningless when viewed only as a process of short-term, often short-sighted, economic growth. It must instead be seen as a process of sustaining human progress on many fronts. Thus in this statement, and in the Commission's report, the concept of sustainable development implies a broad path of human progress and improvement, rather than 'economic development' in the more restricted context of economic growth in developing countries.

This means that 'sustainable development' is a goal not just for the so-called developing nations, but for industrialised nations as well. Given the interdependence of environment/development issues, this broader concept of development must be based on close international cooperation, with developed nations putting their power behind the pursuit of this goal.

#### The interlocking crises

Our planet until recently in human history was a large world in which acts and their effects were neatly compartmentalised within nations, within sectors (energy, agriculture, trade) and within broad areas of concern (environment, economics, society). It is now a very small world in which the boundaries between nations, sectors and concerns have become so insubstantial as to have lost most meaning. This applies in particular to the various global crises which have seized public concern, particularly over the past decade. There is not one crisis: an environmental

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crisis, a development crisis, or an energy crisis. These have been shaken and stirred together to form one crisis.

The planet is passing through several major growth spurts and primal changes. Our human world must make room in a finite environment for one more human world just as big. The present population of some five billion will stabilize at between 8 and 13 billion people sometime next century, according to UN projections. More than 90 per cent of the increase will occur in the poorest countries, and 90 per cent of that increase in already bursting cities.

Economic activity has multiplied to create a \$15 trillion economy. Industrial production has grown more than fifty-fold over the past century, four-fifths of this growth since 1950. The world economy could grow five or ten-fold in the coming half century. Such figures reflect and presage profound impacts upon the biosphere, as the world invests in houses, transport, farms and industries, and much of the economic growth pulls raw material from forests, soils, seas and waterways. The mainspring of economic growth is new technology, and while this technology offers the potential for slowing the dangerously rapid consumption of finite resources, it also entails high risks, including new forms of pollution and the introduction to the planet of new forms of life. Meanwhile, the industries most heavily reliant on environmental resources and most heavily polluting are growing most rapidly in the Third World, where there is both more urgency for growth and less capacity to minimise damaging side effects.

These related changes have locked the global economy and global ecology together in new ways. We have in the past been concerned about the impacts of economic growth upon the environment. We are now forced to concern ourselves with the impacts of the state of our ecological resources - soils, water regimes, atmosphere, forests - upon

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our economic ambitions. We have in the recent past become accustomed to a sharp increase in economic interdependence among nations. We are now forced to accustom ourselves to an accelerating ecological interdependence among nations. Ecology and economy are becoming ever more interwoven - locally, regionally and globally - into a seamless net of causes and effects.

Those whose lives depend directly on environmental resources understand too well how impoverishing the local resource base impoverishes wider areas: deforestation by highland farmers causes flooding on lowland farms; factory pollution can cost fishermen their catch. Such grim local cycles now operate nationally and regionally. Dryland degradation sends environmental refugees in their millions across national borders. Deforestation in Latin America and Asia is causing more, and more destructive, floods in downhill, downstream nations. Acid rain and nuclear fallout have reached across the borders of Europe. Similar phenomena are emerging on the global scale: loss of species, global warming, loss of ozone, and internationally-traded hazardous chemicals entering foods which are themselves internationally traded. [See Box 2]

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BOX 2:

The Commission has sought ways by which global development can be put on a sustainable path into the 21st Century. Some 5,000 days will elapse between the publication of its report and the first day of the 21st Century. What environmental crises lie in store over those 5,000 days?

During the 1970s, twice as many people suffered each year from 'natural' disasters as during the 1960s. The disasters most directly associated with environment/development mismanagement - droughts and floods - affected the most people and increased most in terms of numbers affected. There were 18.5 million drought victims annually in the 1960s, 24.4 million in the 1970s. There were 5.2 million flood victims yearly in the 1960s, 15.4 in the 1970s. Numbers of victims of cyclones and earthquakes also shot up as growing numbers of poor people built unsafe houses on dangerous ground.

The results are not in for the 1980s. But we have seen 30 million afflicted by drought in Africa alone and tens of millions affected by the better managed and thus less-publicized Indian drought. Floods have swept off the deforested Andes and Himalayas with increasing force. The 1980s seem destined to sweep this dire trend on into a crisis-filled 1990s.

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Over the past few decades, life-threatening environmental concerns have surfaced in the developing world. Its countryside is coming under pressure from increasing numbers of farmers; its cities are filling with people, cars and factories. Yet at the same time these developing countries must operate in a world in which the resources gap between most developing and developed nations is widening, in which the developed world dominates in the rule-making of the key international bodies, and in which the developed world has already depleted much of the planet's ecological capital. This is the planet's main 'environmental' problem; it is also its main 'development' problem.

*International economic relationships pose a particular problem for environmental management in poor countries. Exports of natural resources remain a large factor in their economies, especially for the least developed. Agriculture, forestry, energy production, and mining generate at least half the gross national product in many developing countries and account for even larger share of livelihoods and employment. Most of these countries face enormous economic pressures, both international and domestic, to over-exploit their environmental resource base.*

*The recent crisis in Africa which killed uncounted farming families, which threatened the lives of 35 million and which forced 10 million to flee their homes in search of food and water, best and most tragically illustrates the ways in which economies and ecology can interact destructively. The crisis was triggered by drought, but its causes lie deeper. They are to be found in part in policies which gave too little attention, too late, to the needs of peasant agriculture and to the threats posed by rapidly rising populations. But their roots extend also to a global economic system which takes more out of a poor continent than it puts in. Debts which they cannot pay force African nations which rely on commodity sales to take more from their soils than these fragile soils can provide, thus turning good land to desert. Trade barriers in the wealthy nations make it hard for African nations to sell their goods for reasonable returns, putting yet more pressure on ecological systems. Aid from donor nations has been not only inadequate in scale, but too often has reflected the priorities of the nations giving the aid, rather than the needs of the recipients.*

*In Africa, slow decline tipped into disaster. But the production base of other Third World areas suffers similarly from both local failures and from the workings of international economic systems. As a consequence of the 'debt crisis' of Latin America, that continent's natural resources are now being used not for development but to meet the financial requirements of creditors abroad. This approach to the debt problem is short-sighted from several standpoints: economic, political, and environmental. It requires relatively poor countries simultaneously to accept growing poverty while exporting growing amounts of scarce resources.*

*The early 1980s have seen deteriorating terms of trade, rising debt obligations, stagnating aid flows and growing protectionism in the developed market economies. A majority of developing countries now have lower per capita incomes than when the decade began. The increased poverty and unemployment have increased pressure on environmental resources as more people have been forced to rely more directly upon them. It has forced cut-backs in government efforts to protect the environment and to bring ecological consideration into development planning.*

*The deepening and widening environmental crisis presents a greater threat to national security - and even survival - than well-armed, ill-disposed neighbours and unfriendly alliances. Already in parts of Central and South America, Asia, the Middle East and Africa, environmental decline is a major source of economic decline, social decay and political unrest. The recent destruction of much of Africa's dryland agricultural production - with its associated famines and environmental refugees - was more severe than if an invading army had pursued a scorched-earth policy; yet most of the affected governments still spend far more to protect their people from invading armies than invading desert.*

Globally, military expenditures total over \$1 trillion a year and continue to grow. Governments are locked into a military culture derived from traditional, outdated approaches to security. Its most extreme manifestation is the development of potentially planet-destroying nuclear weapons systems in the name of 'security'. Nuclear winter studies suggest that the cold and dark following even a limited nuclear war could destroy plant and animal ecosystems and leave any human survivors occupying a devastated planet very different from the one they inherited.

The same military culture preempts resources which might be used more productively to diminish the security threats created by environmental conflict and the resentments which are fuelled by widespread poverty. Yet governments and international agencies do not assess the cost effectiveness, in terms of achieving security, of money spent on nuclear and other forms of military hardware compared to money spent on reducing poverty or restoring a ravaged environment. Few if any foreign ministries and, to the Commission's knowledge, no defence ministries have evaluated environmental threats to peace and security and compared them with military threats. Such assessments are within neither the institutional mandates nor the personnel capacities of these institutions.

#### Sustainable Development

Many of our efforts to sustain human progress, to meet human needs and to realise human ambitions are simply unsustainable - in both the rich and poor nations. They draw too heavily, too quickly, on already overdrawn environmental resource accounts to be affordable far into the future without bankrupting those accounts. They may

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show profits on the balance sheets of our generation, but our children will inherit the losses. We borrow environmental capital from future generations with no intention of repaying. They may damn us for our spendthrift ways, but they can never collect on our debt to them. We act as we do because we can get away with it: future generations do not vote; they have no political or financial power; they cannot challenge our decisions.

This is changing as the results of the present profligacy close in rapidly. Most of today's decision makers will be dead before the planet feels the heavier effects of acid rain, global warming, ozone depletion or widespread desertification and species loss. Most of the young voters of today will still be alive. In the Commission's hearings it was the young, those who have the most to lose, who were the harshest critics of the planet's present management.

The negative effects of unsustainable development focus attention on the concept of 'sustainable development' - development that which meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- \* the concept of needs, in particular the essential needs of the world's poor, to which overriding priority should be given;
- \* the idea of limitations imposed by the environment's ability to meet present and future needs.

The satisfaction of the basic human needs of all is the major objective of development, in that a world in which poverty is endemic will always be prone to ecological and

other catastrophes. Meeting essential needs requires not only the rapid economic growth of nations in which the majority are poor, but assuring that those poor get their fair share of the resources required to sustain that growth. This in turn requires that those who are more affluent adopt lifestyles within the planet's ecological means. Further, rapidly growing populations can increase the pressure on resources and slow any rise in living standards; thus sustainable development can be pursued more easily if population size and growth are in harmony with the changing productive potential of the ecosystem.

Nations may meet today's needs by overexploiting resources. Technology may solve immediate problems but create bigger ones. Large sections of the population may be marginalized by ill-considered development. Societies may thus in many ways compromise their ability to meet essential needs in the future. This need not happen. Sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs.

These requirements are stringent, and to expect to achieve them in full measure may be unrealistic. But the survival and development of human societies does not require such perfection. These requirements are more in the nature of goals that should underlie national and international action on development. What matters is the sincerity with which these goals are pursued and the effectiveness with which departures from them are corrected. Sustainable development is thus a process of learning and adjustment rather than some ultimate state of complete harmony.

The Institutional Gaps

The ideal of sustainable development and the integrated nature of the global environment/development challenges pose problems for institutions, national and international, which were established on the basis of narrow national preoccupations and compartmentalised concerns. Governments' general response to the speed and scale of global changes has been a failure to recognise sufficiently the need for change. The challenges are both interdependent and integrated, requiring comprehensive approaches and popular participation. Yet the institutions facing those challenges tend to be independent, fragmented, working to relatively narrow mandates with closed decision processes.

There is a growing need for effective international cooperation to manage ecological and economic interdependence. Yet this is matched by growing governmental suspicion of and dwindling support for such organizations. For example, institutions have proved unable to stem increasing protectionism, which acts as a barrier to developing nations' diversifying towards more sustainable forms of development less dependent on exports of raw materials. An imperative of sustainable development is a greater democracy in decision-making, internationally as well as nationally. Yet the powers of decision-making in key organizations such as the International Monetary Fund and the development banks remain concentrated in the hands of a few nations. Also, key nations stay outside of the Law of the Sea Treaty. And the majority of nations remain per force outside of the decision-making processes involving Antarctica. Unless agreement can be reached on equitable and strong joint management of the high seas and Antarctica, then 2/3 of the Earth's surface up from grabs.

The other great institutional flaw in our coping with environment/development challenges is governments' failure to place responsibilities for environmental resources inside those bodies whose activities so deeply affect those resources. This lapse has historical roots. The growing governmental and public concern with the environment in the late 1960s was mainly a concern with damage caused by the rapid economic growth following the Second World War; the need was to clean up the mess. Environmental agencies, ministries and private bodies were established for this task; they accomplished much. But much of their work has of necessity been clean-up, after-the-fact repair of damage: reforestation, reclaiming desert lands, rebuilding urban environments, restoring natural habitats and rehabilitating wild lands.

But the work of these agencies gave many governments and their citizens the false impression that these bodies, few of which have real power within their governments, were by themselves able to protect and enhance the environmental resource base. Experience has shown the error of placing all of our environmental concerns in ministries and institutions which have little or no control over destruction caused by agricultural, industrial, energy, forestry and transportation policies and practices. Responsibility for environmental effects must be given to the 'sectoral' ministries and agencies whose policies cause them.

These agencies' mandates are often too narrow, too concerned with quantities of production or growth. Electricity boards produce power, while the acid pollution they also produce is left to other bodies to clean up. The mandates of ministries of industry include production and profits, while the accompanying pollution is left to

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the ministry of environment. The present challenge is to give to the sectoral ministries and the central economic and planning ministries and agencies responsibility for the quality of their spheres of development, thus for the quality of the parts of the human environment affected by their decisions. This basic change in the mandates of agencies will cause governments to focus on the sources of environmental damage rather than the symptoms.

The same need for change holds for international agencies concerned with development lending, trade regulation, agricultural development, etc. These have been slow to take the environmental effects of their work into account; though some are trying to change this.

The ability to anticipate and prevent environmental damage will require that the ecological dimensions of policy be considered at the same time as the economic, trade, energy, agricultural and other dimensions. They must be considered on the same agendas and in the same national and international institutions. Those making such policy decisions must be responsible for the impact of those decisions upon the environment. This must be one of the chief institutional goals of the 1990s.

## II. THE POLICIES

Before considering the specific, as opposed to the broad conceptual, ways in which institutions must change, it is necessary to consider what changes are required within various areas of human activity to make sustainable human progress possible. The Commission has focused its attention in the areas of population, food security, the loss of species and genetic resources,

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energy, industry, and human settlements - realizing that all of these are connected and cannot be treated in isolation one from another.

In each area, critical objectives for environment and development policy must include: reviving economic growth; changing the quality of growth; meeting essential needs for jobs, food, energy, water, and sanitation; ensuring a sustainable level of population; conserving and enhancing the resource base; reorienting technology and managing risk; and merging environment and economics in decision making.

Population and  
Human Resources Development

In many parts of the world, the population is growing at rates which cannot be sustained by available environmental resources, at rates which are outstripping any reasonable expectations of improvements in housing, health care, food security or energy supplies.

The issue is not just numbers of people, but how those numbers relate to available resources. Thus the 'population problem' must be dealt with in part by efforts to eliminate mass poverty, to assure more equitable access to resources and by education improve human potential to manage those resources. Many people in industrialised nations have already realised that their own lifestyles consume, person for person, far more of the world's resources than do the lifestyles of the developing world. They are beginning to change their ways.

But urgent steps are needed limit extreme population growth. This urgency stems from the needs of the poor themselves in those countries where the death rates are falling and where birth rates remain high. Most of these countries are poor; many face serious population

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pressure on land and resources; in most, the population is doubling every 23-28 years. But this is not just a demographic issue; providing people with facilities and education which allow them to choose the size of their families is a way of assuring - especially for women - the basic human right of self-determination. The extent to which such facilities are made available is itself a measure of a nation's progress in human development.

Choices made now will mean differences in billions of people next century. Longterm UN projections show that at the global level: if replacement level population growth is reached in 2010, world population will stabilise at 7.7 billion by 2060; but if this level is not reached until 2065, global population in 2100 would be 14.2 billion.

Achieving population growth rates which are sustainable calls for close attention to the social and cultural factors which determine fertility rates. Among these are the status of women and the roles they play in the family, the economy, and the society at large. Fertility rates fall as women's employment opportunities outside the home and farm, their access to education, and their age at marriage all rise. Hence policies meant to lower fertility rates must aim to improve the position of women in society.

Rising living standards are the best guarantee that population growth pressures will ease. Poverty breeds children; families poor in income, employment, education and social security need children first to work and later to sustain elderly parents. Measures to provide an adequate livelihood for poor households, to establish and enforce laws protecting children from exploitation, and to provide publicly financed social security will all

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lower fertility rates. Improved public health and child nutrition programmes which bring down infant mortality rates - so parents do not need 'extra' children as insurance against child death - can also help.

Clinics providing primary health care, available through nations and to the poorest in all nations, are also necessary. These will not only greatly improve mother and child health, but can provide a foundation for programmes encouraging the use of modern contraceptives. Family planning programmes must be integrated into health programmes.

School enrolments have increased worldwide; but growing populations mean that the numbers of those unable to read and write are also increasing and will continue to do so in the foreseeable future. While most of the world's boys now receive at least primary education, the enrolment of girls lags far behind, and lags even further behind at secondary levels. This gap must be closed. Environmental education should be included in the school curriculum at all levels. Tribal and indigenous peoples will need special help as the forces of economic development disrupt their traditional lifestyles - lifestyles which can offer modern societies many lessons in the management of resources in complex forest, mountain and dryland ecosystems.

Food Security:

Sustaining the Potential

Growth in world cereal production has steadily outstripped world population growth. Yet each year there are more people in the world who do not get enough food to live active working lives. Agriculture has the resources and the technology to grow enough food for all. But it lacks policies which assure that food is produced where it

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is needed and available to those who need it, that farmers in both developed and developing nations farm their lands in ways that guarantee future production on those lands, and that the livelihoods of the rural poor are more secure.

Subsidies in developed nations encourage farmers to over-use their soil and to over-use chemicals, to pollute both aquifers and foods with these chemicals and to degrade the countryside. Much of this effort produces surpluses and their associated financial burdens. And much of this surplus is sent at concessional rates to the developing world, where it disrupts agricultural policies of recipient nations.

Agricultural policies, or the lack of them, in the developing nations tend to neglect the small, food-growing farmers. Coping with often inadequate technology and few economic incentives, many are pushed onto marginal land: too dry, too steep, lacking in nutrients. Forests are cleared and productive drylands rendered barren.

Providing widespread food security will require more than adding environmental components to agricultural policies. The first step will be the adoption of a global perspective in national agricultural policies, which are too often dominated by short-term goals, too often ignore the special needs farmers in marginal areas, and too often centre around incentive policies which have accumulated almost haphazardly over the years and are now studded with self-defeating contradictions. Most developing nations need more effective incentive systems to encourage production, especially of food crops, to limit harvest and marketplace uncertainty, to build up rural infrastructure and to raise the nutritional levels of vulnerable groups.

*Most developed nations must alter present incentive systems to reduce surpluses and unfair competition with nations which may have real comparative advantages and to promote farming practices which make best use of resources.*

*All nations require policies and incentives to encourage the best use of water resources and of agricultural chemicals. Many which now overuse chemicals and those which cannot afford enough could benefit by seeking organic alternatives. All nations must also make the best use of their varying lands and restore degraded areas; but before doing this most Third World nations will need to take detailed inventories of their land and water resources.*

*The new agricultural technologies offered by genetic engineering, satellite imagery and communications systems will have a greater role to play in Third World agriculture once agricultural research becomes more sensitive to all farmers' conditions and needs, and research and extension efforts are expanded. Farmers, especially the growing numbers of women farmers must be better educated to use new technologies.*

*But food security goes beyond trechnology and increased production; it requires equity among farmers. This will be achieved by land reforms, and by policies to protect the vulnerable subsistence farmers, pastoralists and the landless, who by the year 2000 will number 220 million households. Their greater prosperity will depend on integrated agricultural development which increases work opportunities both inside and outside agriculture, which develops small towns and villages and which increases private and public investments.*

Developed countries can better use their surplus food stocks as emergency relief in times of crisis, while developing nations will have to build up stocks against emergencies through better systems of public intervention in the purchase, storage, transportation and distribution of food. Much of the improvements needed in the Third World will require more sensitive aid for agriculture from developed nations.

New agricultural realities make the nations of the world more interdependent. They require agricultural systems that focus as much on people as on technology, as much on resources as on production and as much on the needs of the future as the needs of the present.

#### Species:

##### Genetic Resources for Development

The planet appears to be undergoing a mass extinction of species, which could well prove to be the greatest setback to life's abundance and diversity since life first emerged over 3.5 billion years ago. There is still time to halt this process.

Though scientists have intensively investigated only one species in 100, wild plants and animals and the genetic material they contain already contribute billions of dollars yearly to the world economy in the form of improved crop species, new drugs and medicines and raw materials for industry. Just as the science of genetic engineering is poised to make even greater use of these genetic resources, they are disappearing before they even can be identified. But utility aside, there are also moral, ethical, cultural, aesthetic and purely scientific reasons for conserving wild beings.

The loss is not only of species. Many individual species are losing sub-units, in the form of races and populations, and thus quickly losing their genetic variability and their ability to adapt to climatic change and other adversity. This applies especially to the gene pools of major crop species such as rice and corn, which amount to only a fraction of the genetic diversity they harboured a few decades ago.

Many species of wetlands, coral reefs, the drylands and the lakes are threatened, but those most in danger are in tropical moist forests, which contain half the world's species and which are disappearing at the rate of between 76,000 and 100,000 square kilometres yearly, with another 100,000 square kilometres grossly disrupted. Were Amazonia's forest cover to be reduced to that in protected areas, 66 per cent of plant species would disappear. Climate warming caused by CO<sub>2</sub> buildup may radically alter these forest ecosystems worldwide.

These extinctions are caused largely by population growth in the tropics, by growing numbers of farmers forced to clear wild habitats, and by the policies of governments - both developing and developed - which encourage deforestation for settlement, for logging and the timber trade, and for agriculture and the commodities trade. Many of these policies are short-sighted in that they bring economic returns for only a few years while grossly undervaluing resources. Governments have myriad opportunities to earn more from their forests over the longer term while at the same time preserving larger areas intact. They would be encouraged in this effort by accurate calculations of the value of wildlands in protecting watersheds and water resources for agriculture.

On the international front, governments should consider agreeing to a 'Species Convention' similar in spirit and scope to other conventions reflecting principles of 'universal resources', and establishing a Trust Fund disbursing several billion dollars annually for the next 10 years at least. Often the nations poorest in conservation resources are richest in species; and the developed countries - which at present stand to gain most financial benefit from these resources - will have to bear much of the costs. But all international development agencies will need to give more attention in their work to the problems and opportunities of species conservation.

Governments must anticipate conservation needs in policy areas such as agriculture, forestry, settlement, and land-use planning in general. They could do this more efficiently if each government incorporated their genetic resource stocks into systems of national accounting.

More parks and protected areas are needed, along with non-conventional protected areas to conserve ecosystems and rare cultivated varieties, improved and expanded gene banks, game cropping and ranching projects, promotion of wildlife-based tourism and anti-poaching measures.

Extinction is one of the few irreversible forms of environmental damage, and the failure to conserve species may be the failure which future generations will be least likely to forgive.

Industry:  
Producing More with Less

The world manufactures seven times more goods today than it did as recently as 1950. Given population growth rates, a fivefold or tenfold increase in manufacturing output will be needed just to raise Third World consumption standards to developed world standards by the time growth rates level off next century.

Yet conversely, manufacturing has declined in importance relative to other sectors of the economy in recent years, even in many developing countries. But international trade in manufactured goods has consistently grown faster than manufacturing output, and many developing nations have shared in this growth and made rapid gains in industrialisation.

Experience in the developed nations has proved that anti-pollution technology has not cost as much as once feared, that it has been cost-effective in terms of health, property and environmental damages avoided, and that it has made many industries more profitable by making them more resource efficient. While economic growth has continued, the consumption of raw materials has held steady or even declined, and new technologies offer further efficiencies.

These will be needed in the Third World, where nations are processing more of their raw materials and where heavy, high pollution industries are growing rapidly in relation to light industry. These nations can use elements of the resource-efficiency revolution in the developed countries to skip some of the more onerous steps of Northern industrial development. New technologies which make economies of scale less important will allow

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them to establish small-scale, decentralised and widely-dispersed factories, relieving big cities of population and pollution pressures and spreading job opportunities throughout the countryside.

Developed nations have widely adopted the 'Polluter Pays Principle', by which industries are encouraged to reflect environmental costs in the prices of products. This places much of the cost of pollution clean-up on industry and thus on consumers.

But it also requires the effective use of economic instruments such as taxation, pollution or waste charges, resource pricing, and subsidies or low-interest financing for pollution control equipment. In that it means government intervention in the function of the marketplace, it can also be applied in centrally planned economies, and offers much that can be effectively borrowed and improved upon by developing economies. Oil conservation gains following the price hikes of the 1970s demonstrated the importance of pricing policies for any resource that reflect a more realistic cost of that resource, taking into account their current stock, depletion rates, availability of substitutes and any unavoidable damage associated with extraction or processing.

The developing nations will eventually have to bear the costs of any inappropriate industrialisation, and many are realising that they have neither the resources nor - given rapid technological change - the time to damage their environments now and clean up later. But they will also need help and information from industrialised nations to make the best use of technology. Transnational corporations have a special

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responsibility to smooth the path of industrialisation in the nations in which they operate.

Emerging technologies offer the promise of increased efficiency and decreased pollution, but many bring risks of new toxic chemicals and wastes and of major accidents of a type and scale beyond present coping mechanisms. The control of chemicals and hazardous wastes must be tightened, and responses to accidents improved both nationally and, as effects spill increasingly over borders, internationally.

Industrial development is 'sustainable' when it takes from the environment what is within the environment's ability to provide, both now and in the future, and when it widens rather than limits future possibilities for human progress. But industry uses non-renewable as well as renewable resources, so its sustainability will always be a relative concept based on continually improving resource efficiency - based, in essence, on its ability to produce more using less.

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TO COME:  
(continuing Ramphal outline)

Energy

Settlements

III. INTERNATIONAL COOPERATION

Global Commons

Threats to Biosphere

International Economy

Security

IV. INSTITUTIONAL REFORM