



*Global
Change
and*

OUR COMMON FUTURE

Gro Harlem Brundtland, prime minister of Norway, delivered the sixth annual Benjamin Franklin Lecture on 2 May 1989 as the keynote address at the Forum on Global Change and Our Common Future, held in Washington, D.C. The text of her speech appears here. The forum was sponsored by the U.S. National Academy of Sciences; the Smithsonian Institution in cooperation with the U.S. Man and the Biosphere Program; the American Association for the Advancement of Science; Sigma Xi, the scientific research society; and the National Science Foundation. The forum featured scientists and policymakers from around the world who discussed the implications of environmental issues for public policy, while focusing

in particular on global change and its impact on the Americas.

Brundtland's background comprises both science and public policy. She holds a medical degree from the University of Oslo and a master's degree in public health from Harvard University. She became Norway's minister of the environment in 1974 and held the post through 1979, at which time she left to take a seat in the Norwegian parliament, to which she had been elected in 1977. Her contribution to environmental issues was recognized internationally in 1983, when she became chairman of the World Commission on Environment and Development, a post she still holds. She has been prime minister since 1986.

By Gro Harlem Brundtland

We are living in an historic transitional period in which awareness of the conflict between human activities and environmental constraints is literally exploding. This finite world will have to provide food and energy and meet the needs of a doubled world population sometime in the next century. It may have to sustain a world economy that is 5 to 10 times larger than the present one. It is quite clear that this cannot be done by perpetuating present patterns.

In the never-ending human search for an improved habitat, for new materials, new energy forms, and new processes, the constraints imposed by depletion of natural resources and the pollution caused by the conversion of resources have brought mankind to a crossroads.

In spite of all the technological and scientific triumphs of the present century, there have never been so many poor, illiterate, or unemployed people in the world, and their numbers are growing. Close to one billion people are living in poverty and squalor, a situation that leaves little choice, in a struggle for life which often undermines the conditions for life itself—the environment and the natural resource base.

We continue to live in a world where abundance exists side by side with extreme need, where waste overshadows want, and where our very existence is in danger due to mismanagement and overexploitation of the environment.

The undermining of respect for international obligations was one of the many negative trends in international politics during the 1970s and the early 1980s.

I believe that the threats to the global environment have the potential to open our eyes and to make us accept that North and South will have to forge an equal partnership. The threats to the global climate prove beyond doubt that, if everyone does as they please in the short run, we will all be losers in the long run. We need to develop a more global mentality in charting the course toward the future, and we need sound sci-

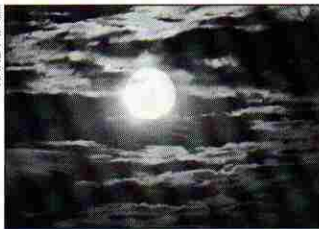
entific advice and firm political and institutional leadership.

We face a grim catalogue of environmental deterioration. We know that forests are vanishing; every year 150,000 square kilometers disappear. We are becoming increasingly aware of the spread of desert land; the yearly rate is 60,000 square kilometers. Good soil is being washed away or eroded at alarming rates. It is estimated that about 150 plant and animal species are becoming extinct every day—most of them unknown to laymen and specialists alike. The stratospheric ozone shield is in danger. And, above and beyond all these signs of environmental crisis, the climate itself is threatened.

As the challenging dynamics of global change gradually become clearer, the role of the men and women of science in shaping our common future becomes more central. The interplay between the scientific process and the making of public policy is not a new phenomenon. Indeed, it has been a characteristic of most of the great turning points in human history. One need look back no further than the dawning of the nuclear age to conclude that names such as Fermi, Bohr, Oppenheimer, and Sakharov have influenced today's world just as much as Roosevelt, Stalin, Churchill, Gandhi, and Hammarskjöld.

It may be more important now than ever before in history for scientists to keep the doors of their laboratories open to political, economic, social, and ideological currents. The role of the scientist as an isolated explorer of the uncharted world of tomorrow must be reconciled with his role as a committed, responsible citizen of the unsettled world of the present.

The interaction between politics and science has been decisive in the pursuance of international consensus on the problem of stratospheric ozone depletion. The protocol which was hammered out in Montreal in September 1987,¹ which provides for reducing



chlorofluorocarbon (CFC) emissions by 50 percent over the next decade, could never have been achieved without a delicate balance between the most up-to-date scientific information, reliable industrial expertise, and committed political leadership against a background of strong and informed public interest.

The fact that new scientific data on the threat to the ozone layer have already prompted us to move beyond the 1987 accords only underlines my point: The scientist's chair is now firmly drawn up to the negotiating table right next to that of the politician, the corporate manager, the lawyer, the economist, and the civic leader. Indeed, moving beyond compartmentalization and outmoded patterns to draw upon the very best of our intellectual and moral resources from every field of endeavor lies at the very heart of the concept of sustainable development.

It is a rare privilege to be . . . in Washington . . . and to speak about the challenges before us as we approach the end of a century that has brought more changes than the entire previous history of mankind. I do so emphasizing that U.S. leadership will be decisive if we are to succeed on a global scale in making the necessary changes. I do so with the greatest respect and admiration for the human and material resources of this country, resources which can and must be mobilized for sustainable development if we are to overcome the interlocked environment and development crisis. . . .

Today, the international agenda has grown more varied and complex but also more promising. Advances are being made in a number of fields, including the easing of tensions between East and West with the ensuing gains for peace and security and the settlement of regional conflicts.

Should we not take advantage of this favorable climate and direct our efforts toward the critical environment and development issues facing us? Many of these problems cannot be solved within the confines of the nation-state nor by maintaining the dichotomy between friend and foe. We must increase communication and exchange and cultivate greater pluralism and openness.

In 1987, the World Commission on Environment and Development presented its report, *Our Common Future*.² The commission sounded an urgent warning: The present trends cannot continue; they must be reversed.

The world commission did not, however, add its voice to that of those who are predicting continuous negative trends and decline. The commission's message is a positive vision of the future. Never before in our history have we had so much knowledge, technology, and resources. Never before have we had such great capacities. The time and the opportunity have come to break out of the negative trends of the past.

What we need are new concepts and new values based on a new global ethic. We must mobilize political will and human ingenuity. We need closer multilateral cooperation based on the recognition of the growing interdependence of nations.

The world commission offered the concept of sustainable development. It is a concept that can mobilize broader political consensus, one on which the international community can and should build. It is a broad concept of social and economic progress. The commission defined sustainable development as meeting the needs and aspirations of the present generation without compromising the ability of future generations to meet their needs. It requires political reform, access to knowledge and resources, and a more just and equitable distribution of wealth within and between nations.

Over the past couple of years, some progress has been made in the environmental field, both in terms of raising consciousness and in terms of taking on particular challenges, such as in the Montreal Protocol on the ozone layer and the Basel Convention on hazardous wastes.³ However, the picture is very uneven, and the achievements far from justify complacency.

As far as development is concerned, however, the 1980s have been a lost decade. Though some coun-



tries have done well, there has been widespread economic retrogression in the Third World. Living standards have declined by one-fifth in sub-Saharan Africa since 1970.

Unsustainable, crushing burdens of debt, reverse financial flows, depressed commodity prices, protectionism, and abnormally high interest rates have all created an extremely unfavorable international climate for development in the Third World.

Politically, economically, and morally, it is unacceptable that there should be a net transfer of resources from the poor countries to the rich. Paradoxically, the fact of the matter is that, while close to a billion people are already living in poverty and squalor, the per capita income of some 50 developing countries has continued to decline over the past few years.

These trends will have to be reversed. As pointed out by the World Commission on Environment and Development, only growth can eliminate poverty. Only growth can create the capacity to solve environmental problems. But growth cannot be based on overexploitation of the resources of developing countries. Growth must be managed to enhance the resource base on which these countries all depend. We must create external conditions that will help rather than hinder developing countries in realizing their full potential. What we now need is global consensus for economic growth in the 1990s. It must comprise:

- Economic policy coordination that will promote vigorous, noninflationary economic growth. Major challenges include reducing payment imbalances between the United States, Japan, and the Federal Republic of Germany and making the surpluses of Japan, the Federal Republic of Germany, and other countries increasingly available to developing countries. From a world development point of view, the financial surpluses of the Organization for Economic Cooperation and Development (OECD) countries should increasingly be used for investments in developing countries rather than for financing private consumption in the major industrialized countries.

- We need policies that will secure more stable ex-

change rates and increased access to markets on a global basis. Protectionism is a confrontational issue and a no-benefit game. Every year, protectionism costs the developing countries twice the total amount of development assistance they receive. The benefits of free trade both for the North and for the South are obvious.

- We need policies that will sustain and improve commodity prices.

- Policies must encourage and support diversification of the economies of the developing countries. We need adjustment programs that are realistic. Their pace and sequence must be carefully tailored to the characteristics and development priorities of the individual countries through a policy of dialogue. More must be done to incorporate poverty concerns and environmental considerations into adjustment programs.

- We need major new efforts, based on the recent [Nicholas] Brady initiative, that will reduce debt. For debt owed to multilateral institutions, the scheme based on a Nordic proposal to soften interest payments on such loans has been taken up by the World Bank. We believe this and similar schemes should be extended in the future.

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A very civilized, ancient legal provision on debt reads as follows: "If a man owes a debt, and the storm inundates his field and carries away the produce, or if the grain has not grown in the field, in that year he shall not make any return to the creditor, he shall alter his contract and he shall not pay interest for that year."



This quote is taken from the Code of Hammurabi, king of Babylon, which dates from the year 2250 B.C. Four thousand years later, the debt burdens, the environmental crisis, and the decline in the flows of resource transfers are trends that call for equally civilized considerations.

- In addition to our debt efforts, what is called for is increased development assistance—nothing short of a Marshall Plan for the poorer nations of the developing world, notably for Africa. I see no reason to conceal that, while Norway has given around 1.1 percent of its gross national product (GNP) in official development assistance to developing countries in recent years, we are disappointed that the OECD average has declined to a meager 0.34 percent. Those donor countries that have been lagging behind in their Official Development Assistance (ODA) transfers should now make renewed efforts in line with their abilities.

The Soviet Union and Eastern Europe must also contribute to a far greater extent than they have done so far. The developing countries have been declaring their readiness to do their part in terms of policy reforms and constructive negotiations.

A global consensus for economic growth in the 1990s must be consistent with sustainable development. It must observe ecological constraints. There are no sanctuaries on this planet. If the next decade is to be truly a decade of response to the serious problems that confront the world, the issue of sustainable global development must receive special and urgent attention.

It is time for a global economic summit to launch a new era of international cooperation. Issues like the debt crisis, trade matters, resources for the international financial institutions, harnessing technology for global benefit, strengthening the United Nations system, and specific major threats to the environment, such as global warming, are becoming increasingly interrelated. Would it not be appropriate to consider both our economic and our environmental

concerns together at such a summit, given the critical links between the two?

The Third World seems convinced that international poverty is not a mere aberration of international economic relations that can be corrected by minor adjustments but, rather, the unspoken premise of the present economic order. Developing countries have

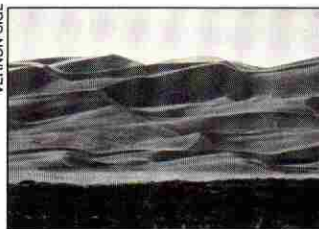
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had to produce more and sell more in order to earn more to service debt and finance imports. And the amount of coffee, cotton, or copper they have had to produce to buy a water pump, antibiotics, or a lorry has kept increasing. This has led to overtaxation of the environment. It has fueled soil erosion and accelerated the cancerous process of desertification and deforestation. This in turn has begun to threaten genetic diversity, which is the basis for tomorrow's biotechnology, agriculture, and food supply.

Biotechnology is a case in point. The effects of modern biotechnology on agriculture and food security in the Third World must be given special care and attention. Clearly, the production of enough food to feed a doubled world population is inconceivable without biotechnology. But there are inherent dangers that could, unless they are avoided, further widen the gap between poor and rich.

The benefits of plant breeding and plant varieties with greater resistance and more rapid growth potential have been and will continue to be immense. But these benefits may become available only to the rich, while the genes employed in the process often originate in developing countries that derive very little benefit from their use.

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Our Common Future

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Strong international corporations may dominate this field. Legal protection and very firm rules regarding rights of ownership may reduce the availability of products that are important for nutrition and the prevention of famine.

Small-scale farmers in the Third World risk being victims in this process. Biotechnology may produce substitutes for their crops. They may lose income and the ability to provide for their families.

The industrialized countries have a responsibility for controlling market forces in this field and for pro-

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moting a more equitable sharing between developed and developing countries. The protection of intellectual property rights and royalties must be in a form that promotes research, provides for an equitable sharing of financial benefits between inventors and the country of genetic origin, and, not least, makes the products of biotechnology available to those who need them.

We need to foster a stronger sense of collective responsibility and make the international bodies we have created more effective. The time has come to seek more innovative structures for cooperation than those we have available at present. Stronger mandates for making binding decisions should be worked out.

The threats of global heating and climatic change may be the most severe to future development. Life on Earth depends on the climate. Human settlement,

food production, and industrial patterns are at stake.

The effects of climate change may be enormous. The impact may be greater and more drastic than any other challenge previously facing mankind, with the possible exception of the threat of nuclear war.

There is one big, decisive difference here: Whereas nuclear war can be avoided (and at present it seems more remote than at any time since World War II), we will be caught in the heat trap of global warming unless we reduce our consumption of fossil fuels.

We may be about to alter the entire ecological balance of the Earth. The time span needed for plants and animals to adjust to a new climate is normally hundreds of years. However, unless drastic changes are made, the ecosystems will not be able to adjust. Deserts will spread. Crops will be lost. Last year's drought may not have been the result of climatic change, but what will happen if we experience 2 such dry summers—or 10 such dry summers—in succession? What will happen to food production? Can we conceive of a doubling of food prices or even a scarcity of food in the industrialized countries? The developed countries may be able to cope in the short run, as long as they can pay for necessary imports. But that option will soon be lost to the developing countries.

Can we conceive of the effects on low-lying countries if the sea level should rise according to predictions? Can we see any solutions to the political instability that will accompany increased migration as the number of environmental refugees continues to multiply?

All this may not happen, or it may not be that drastic. But the potential risks are so high that we cannot sit back hoping that the problems will solve themselves.

The present generation has a great responsibility: It is this generation that will have to set limitations on our own use of limited resources, in particular on the burning of fossil fuel. We must recognize that the Earth's atmosphere is a closed system; we are not getting rid of our emissions. In



fact, it is like a car that pours out its gases into the driver's compartment.

We must tackle the myth that energy consumption must be allowed to grow unchecked. The industrialized countries have the greatest resources, both financially and technologically, to change production and consumption patterns. The developing countries will need much more energy in the future. Many of them have contributed only marginally to the greenhouse effect, and many of them will be most severely victimized by global heating. They must be allowed more time for adaptation and a chance to increase their consumption.

We need concerted international action. There are certain imperatives that must be pursued with vigor as matters of the utmost urgency:

- We need to agree on regional strategies for stabilizing and reducing emissions of greenhouse gases. Reforestation efforts must be included as a vital part of the carbon equation.
- We must strongly intensify our efforts to develop renewable forms of energy. Renewable energy should become the foundation of the global energy structure during the twenty-first century.
- It is quite clear that developing countries will need assistance to avoid making the same mistakes we have made over again. It is essential that energy-efficient technology be made available to developing countries when they cannot always pay market prices without assistance.
- We should speed up our efforts on international agreements to protect the atmosphere. There are different views on how to proceed on this issue. I urge that negotiations to limit emissions be started immediately.

On 11 March, 22 heads of state and government signed a declaration that set a standard for future achievements to protect the atmosphere.⁴ In the Declaration of the Hague, we called for more effective decisionmaking and enforcement mechanisms in international cooperation as well as greater solidarity among nations and between generations. The princi-

ples we endorsed were radical, but any approach that is less ambitious would not serve us.

The declaration calls for new international authority with real powers. On occasion, the power must be exercised even if unanimity cannot be reached.

The time has come to seek more innovative structures for cooperation than those we have available at present.

We must have defined standards and ensure compliance. We must have effective regulatory and supportive measures and uphold the rule of law.

Sharing the burden is essential. That is why we called for fair and equitable assistance to compensate those developing countries that will be most severely affected by a changing climate but that have contributed only marginally to global heating.

The Norwegian government last Friday [28 April] adopted a white paper on the follow-up of the world commission's report. It has involved all ministries and not only that of environment. It has implied changes in attitudes and policies and tough challenges for the heavy-sector ministries such as energy, industry, transportation, finance, foreign affairs, and trade, and the prime minister's office has been directly engaged in charting a cross-sectoral course for the future.

The issue of atmospheric pollution and climate change proved to be a very difficult one. It is difficult because Norway has been fortunate to have vast hydropower resources. We do not burn coal or oil to produce electricity. Any reductions of carbon dioxide (CO₂) emissions in Norway would involve transportation.

Many also ask why Norway could make a difference when we cause only 0.2 percent of global CO₂



emissions. Should we impose limitations upon ourselves even if other countries have not yet done so?

The Norwegian government has chosen to set out clear goals. I believe we are the first country to make a political commitment for reductions of CO₂ emissions. Norway set a policy for stabilizing its emissions of CO₂ in the course of the 1990s and, at the latest, by the year 2000. The government presupposes that, thereafter, a reduction will be possible. With our reductions of CFCs and oxides of nitrogen (NO_x), Norway will be able to reduce its total emissions of greenhouse gases by the turn of the century.

Clearly, the larger ecological issues—the ozone layer, global warming, and the sustainable utilization of the tropical forests—are tasks facing mankind as a whole. To finance these tasks, we will need additional resources.

In the white paper, our major policy document on sustainable development, the Norwegian government is proposing as a starting point that industrialized countries allocate 0.1 percent of gross domestic product (GDP) to an international fund for the atmosphere. Such a fund should be created to help finance transitory measures in developing countries and reforestation projects. Ideally, all countries should take part in this. Every country would then make its contribution.

Much work is needed to make this proposal operational, and it will be met with considerable reluctance. But, unless we establish a set of international support mechanisms, chances are slim that we will be able to make the transition in time.

I have presented to you the essence of *Our Common Future*. To transform it into reality will require broad participation. Every single individual can make a difference. Changes are the sum of individual actions based on common goals.

A particular challenge goes to youth. More than ever before, we need a new generation—today's young people—who, with new energy and dedication, can turn

ideas into reality.

Many of today's decisionmakers have yet to realize the peril in which this Earth has been placed. I believe that *Our Common Future* can be an effective lever in the hands of youth and that it can transcend nationality, culture, ideology, and race. Youth will hold their governments responsible and accountable, and youth will be stalwarts for the foundation of their own future.

Many of you will continue the dialogue on global change and our common future. I want to draw your

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attention to another major forum to take place in November here in the United States. Organized by the Global Tomorrow Coalition with a wide spectrum of cosponsors, the Globescope Pacific Assembly in Los Angeles will feature, on 1 and 2 November, the first comprehensive public hearing in the United States on the action and policy implications of the report of the World Commission on Environment and Development. The assembly is designed to encourage discussions on the policy implications of the concept of sustainable development both in the public and in the private sectors.

Leaders from government, science and technology, business, education, citizens' organizations, trade unions, churches, foundations, youth groups, and media are invited to take part. I hope that many of you will choose to share in this unique initiative to which I give my full support.



In closing, let me stress the need for all of us to view environmental problems in interdisciplinary terms, not in narrow terms of specialization. The world is replete with projects that made excellent engineering sense but were economically disastrous, or that were economically sound but environmentally catastrophic. The global environment cannot be separated from political, economic, and moral issues. Environmental concerns must permeate all decisions, from consumer choices through national budgets to international agreements. We must learn to accept the fact that environmental considerations are part of the unified management of our planet. This is our ethical challenge. This is our practical challenge—a challenge we all must take.

NOTES

1. United Nations Environment Programme, *Montreal Protocol on Substances that Deplete the Ozone Layer, Final Act*, 16 September 1987. The protocol requires the signatories to freeze current production of five CFCs at 1986 levels and cut production in half by 1 July 1998.
2. World Commission on Environment and Development, *Our Common Future* (London: Oxford University Press, 1987).
3. The United Nations Environment Programme sponsored the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, an international treaty that was signed in March 1989 by representatives of 30 countries.
4. The declaration was made at the end of the 1989 Ministerial Conference on Atmospheric Pollution and Climate Change at the Hague. The statement called for a new United Nations authority that would be responsible for combating global warming. This authority would undertake or commission scientific research and ensure the sharing of technological information among nations. The authority would also set standards for protection of the atmosphere and monitor compliance.

Overview

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importers of hazardous waste. In Nigeria, the mandatory penalty for anyone convicted of illegal waste dumping is life imprisonment.

In an effort to curb waste dumping in developing countries, the United Nations Environment Programme (UNEP) has sponsored an international treaty to control transboundary movements of hazardous wastes. During the treaty negotiations, many developing countries appealed to UNEP for a global ban on hazardous waste trade, and early drafts of the convention did contain strong mechanisms to discourage, and in some cases ban, waste exports. However, the United States was primarily responsible for stripping the final version of any substantive mechanisms to curtail the growing international trade. At the negotiation sessions, representatives of the Bush administration labored against banning the international trade of hazardous waste, against controlling the international transport of radioactive waste, against establishing minimum international waste manage-

ment standards, and against requirements to inform nations in advance if hazardous wastes will be shipped through their territorial waters. The United States threatened not to sign the treaty if it prohibited states with stricter environmental standards from shipping hazardous wastes to states with less developed regulations.

After two years of negotiations, the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and

light of the failure of the United States' export notification program, the treaty does not offer any real hope that this burdensome export control system will be effectively enforced.

It is now up to Congress to deter U.S. waste generators who wish to avoid the waste crisis by exporting pollution abroad. The export of wastes from the United States to developing countries is economically, environmentally, morally, and technically in-

Citizens in many developing countries are vehemently demanding an international ban on "toxic terrorism."

their Disposal was signed in March 1989. Instead of banning the international trade in hazardous wastes, this UNEP treaty essentially legitimizes it, by allowing countries to export with prior informed consent. Although 30 countries signed the treaty, many developing countries refused on the grounds that the treaty does not offer any real protection from unwanted waste imports. In

defensible and should be prohibited except in unusual, strictly defined conditions. The United States should work to establish world leadership on waste management by simultaneously promoting available technologies to reduce the volume and toxicity of generated wastes and developing the technical capacity to dispose of those wastes safely in the United States. Legislation