



United Nations Educational, Scientific and Cultural Organization

Educating for a Sustainable Future:

.....

A Transdisciplinary Vision for Concerted Action

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PREFACE BY THE DIRECTOR-GENERAL OF UNESCO

Moving towards the goal of sustainability requires fundamental changes in human attitudes and behaviour. Progress in this direction is thus critically dependent on education and public awareness. The concept of sustainable development - as this document suggests - is not a simple one, and there is no road map to prescribe how we should proceed. Yet time is short, and we are called upon to act without delay. We must move ahead now, in a spirit of exploration and experimentation and with the broadest possible range of partners, so as to contribute through education to correcting trends that place in jeopardy our common future.

The **International Conference on Environment and Society: Education and Public Awareness for Sustainability**, organized by UNESCO and the Government of Greece, is designed to highlight the role of education and public awareness for sustainability, to consider the important contribution of environmental education in this context, and to mobilize action to this end. The Conference follows on from major meetings relevant to education for sustainable development held in Tbilisi in 1977, Jomtien in 1990, Toronto in 1992 and Istanbul in 1993 as well the series of United Nations conferences beginning in 1992 with Rio (environment and development) and followed in 1994 by Cairo (population), in 1995 by Copenhagen (social development) and Beijing (women), and in 1996 by Istanbul (human settlements). It is also being held at the end of a year that, on the occasion of the 20th anniversary of the Tbilisi Conference and the fifth anniversary of the Rio Conference, has seen the organization of numerous national and regional events (many with the backing of UNESCO), providing a wealth of information on the situation in countries around the world.

Twenty years after Tbilisi and five years after Rio and ECO-ED, who would deny that too little has been achieved? As I stated at the special session of the General Assembly held in June 1997 to review progress five years after UNCED: "the key to sustainable, self-reliant development is education - education that reaches out to all members of society through new modalities and new technologies in order to provide genuine lifelong learning opportunities for all .. We must be ready, in all countries, to reshape education so as to promote attitudes and behaviour conducive to a culture of sustainability". In keeping with its mandate and its designation as Task Manager for chapter 36 of Agenda 21, UNESCO has a special responsibility with regard to education and public awareness for sustainability. In 1994 it launched an international initiative "Educating for a Sustainable Future" - known as the EPD Project - to serve as a stimulus for transdisciplinary reflection and action. EPD is the main mechanism through which UNESCO responds to the recommendations of all the United Nations conferences concerning education, information and public awareness related to sustainable development.

It is in its function as Task Manager for chapter 36 of Agenda 21 that UNESCO has prepared the Thessaloniki Conference, acting as mobilizer and facilitator to bring together representatives of the United Nations system, governments, NGOs, experts and other major interested parties. The main framework for action is the special work programme on education, public awareness and training initiated by the United Nations Commission on Sustainable Development (CSD) at its fourth session in 1996 and carried forward in its second five-year programme of work. In addressing the priorities identified by the Commission, the Thessaloniki

Conference is intended to provide UNESCO with elements to prepare an expanded version of the special work programme for consideration by the CSD at its sixth session in 1998.

In preparing the present document, UNESCO has drawn on a wide variety of sources: the results of the many national and regional conferences mentioned above; contributions from the United Nations system and key institutional partners such as the World Bank, OECD and the World Conservation Union (IUCN); the views of experts in all branches of education and specialists from other relevant disciplines; and inputs from the whole range of UNESCO's programmes in education, science, culture and communication. A draft compiled from these diverse materials was reviewed by some thirty-five experts, whose extensive comments were integrated into the final version.

This document - the result of a collective "brainstorming" - is to be seen as a beginning of a process not a conclusion, as an attempt to stimulate discussion not to direct it, as an action-oriented paper not a blueprint for action. It is at once the main working document for the Thessaloniki Conference and a response to the work programme of the CSD, which "calls upon UNESCO to refine the concept and key messages of education for sustainable development, taking into account the experience of environmental education and integrating considerations pertaining to population, health, economics, social and human development, and peace and security". Its intended public is not mainly those professionally concerned with education for sustainable development - many of whom will be familiar with the concepts and issues presented - but rather the multiple partners and broad community of stakeholders in the educational enterprise. It is for this reason that the document has been made available on the Internet in its English, French and Spanish versions and why a special web site is being developed by UNESCO to provide a knowledge management system for chapter 36, which will include a registry of innovative practices in the field.

Promoting sustainable development, whose close interrelationship with democracy and peace is increasingly recognized, is one of the key challenges of our time; and education in all its forms is vital to addressing it successfully. UNESCO believes in education as the force of the future - which cannot be other than a sustainable future - and is committed to maximizing its efforts and multiplying its partnerships for the development and deployment of this force in the cause of peace and human betterment.

A handwritten signature in black ink, consisting of a tall, thin vertical stroke followed by a series of connected, wavy horizontal strokes.

Federico Mayor

EXECUTIVE SUMMARY

This document was prepared by UNESCO in its function as Task Manager for chapter 36 of Agenda 21 to serve two purposes. First, it is the main background paper for the International Conference on Environment and Society: Education and Public Awareness for Sustainability to be held in Thessaloniki, Greece, from 8 to 12 December 1997. Second, it is a contribution by UNESCO to the implementation of the special work programme on chapter 36 of Agenda 21 of the UN Commission on Sustainable Development (CSD) which "calls upon UNESCO to refine the concept and key messages of education for sustainable development".

The document is based on a wide variety of source materials, background papers prepared by specialists, and a preparatory meeting held in September 1997. It is to be considered the beginning of a process of discussion and debate, not a conclusion. Among the international institutions contributing to its preparation were: FAO, IUCN, OECD, UN-DESA, UNDP, UNEP, UNFPA, WHO and the World Bank, in addition to the Greek Organizing Committee for the Thessaloniki Conference.

Beginning with a preface by the Director-General of UNESCO, the paper addresses priority issues reflected in the work programme of the CSD. Part I ("What is 'Sustainability'?") examines the emerging vision of "sustainability" or "sustainable development", including consideration of its inter-related components such as population, poverty, environmental degradation, democracy, human rights and peace, "development", and interdependence. The role of education seen in this perspective is discussed, no longer as an end in itself but as a key instrument for achieving sustainability in the future.

Part II ("Public Awareness and Understanding: the Fuel for Change") takes up the topic of public awareness and understanding as indispensable to support change towards sustainable development. Problems of vested interests, the difficulties of communicating science, the inherent complexity of the issues, and the tendency of the media to focus on extreme positions and controversies are considered. It is suggested that the most effective communication strategy for building awareness and understanding is to focus on problems which the public experiences in everyday life.

Part III ("Reorienting Education to Support Sustainability") emphasizes the importance of the concept of lifelong learning in a rapidly changing world, as well as the need to give high priority to basic education in the developing world. The need to reform curricula and educational policies and structures at all levels is also discussed, with an example given of recent reform of the curriculum in Toronto, Canada. The importance of teacher education and training as well as higher education in general is stressed. The valuable experience and role of environmental education is reviewed, and the need to develop interdisciplinary studies and programmes at all levels emphasized.

Part IV ("Shifting to Sustainable Lifestyles: Changing Consumption and Production Patterns") notes that the effectiveness of awareness raising and education for

sustainable development must ultimately be measured by the degree to which they change the attitudes and behaviors of people as both consumers and citizens. Changes in lifestyles as reflected in individual behavior, households and at community level must take place. Particular emphasis is given to wasteful consumption patterns.

Part V ("Ethics, Culture, Equity: Sustainability as a Moral Imperative") evokes some ethical principles of sustainability such as the "ethic of time", complexity as an ethical issue, the ethical link of past, present and future. The overriding importance of culture in achieving sustainability is discussed, and a parallel drawn between the loss of biological diversity and the loss of cultural diversity. The role of education in communicating the moral imperative of sustainability is emphasized.

Finally, Part VI ("Mobilizing for Action") highlights the international framework for action and the new vision of education, public awareness and training which have emerged from the series of UN conferences beginning with Rio in 1992. The umbrella role of chapter 36 of Agenda 21, the work programme of the CSD adopted in 1996, and the reaffirmation of the importance of education by the Earth Summit + 5 are explained. Information is provided about the preparation, by UNESCO as Task Manager, of an expanded work programme for consideration by the CSD in 1998, working together with the UN system and other key international partners. Action at the national and local levels is discussed as the most effective and appropriate way to bring about the required change.

This document is obviously far from complete in terms of all that could be said on this vast subject. It is therefore intended as the beginning of a process and debate not a conclusion, as an attempt to stimulate discussion not direct it, and as an action-oriented paper not an action plan. This first attempt to articulate the key messages of education for sustainable development and to consider its many components will need to be refined over time, with the widest possible discussion and participation to which UNESCO is committed.

In embracing the broad scope of chapter 36 and in addressing the priorities laid out in the CSD work programme, there are naturally some areas which are more advanced than others. It is for this reason that UNESCO anticipates that strategy papers on the different topics dealt with in this paper and for different regions of the world will need to be prepared in the future.

INTRODUCTION

1. This paper was prepared by UNESCO in its function as Task Manager for chapter 36 of Agenda 21. It serves two purposes:

- It is the main background paper for the International Conference on Environment and Society: Education and Public Awareness for Sustainability, to be held in Thessaloniki, Greece, from 8 to 12 December 1997. As such, the document is intended to provide stimulus to discussion at the conference, rather than as a document for discussion *per se*.
- It is a contribution by UNESCO as Task Manager to the implementation of the special work programme on chapter 36 of the UN Commission on Sustainable Development which "calls upon UNESCO to refine the concept and key messages of education for sustainable development, taking into account the experience of environmental education and integrating considerations pertaining to population, health, economics, social and human development, and peace and security".

2. UNESCO as Task Manager for the CSD Work Programme is preparing an expanded version for consideration by the Commission at its sixth session in April 1998. The Thessaloniki Conference has been designed to provide UNESCO with elements for that task as well as to mobilize action at international, national and local levels.

3. The document has been written based on a wide variety of source materials, including United Nations publications, documents and reports, studies issued by non-governmental organizations and academic institutions and accounts published in newspapers and journals. In addition, specialists on different aspects of sustainable development were invited to prepare background papers on selected aspects of the conference programme for use in the preparation of conference documentation. As a further step to prepare the conference, a panel consisting of UNESCO staff and outside experts was convened at UNESCO Headquarters on 22 and 23 September 1997 to discuss the organization and objectives of the conference and the nature of the documentation required. Account was also taken of the results of the numerous recent national, regional and international events on the subject.

4. An earlier draft of this document was circulated to individual experts both within and outside UNESCO as well as to numerous partner organizations and all sectors of the UNESCO secretariat. The high interest in the conference and the subject matter it addresses is demonstrated by the more than thirty-five responses received. Many of them were extremely detailed, ranging from five to thirty or more pages. All sectors of UNESCO also contributed to the revision of the paper through written responses and/or oral discussions. The paper has been extensively revised in the light of the suggestions, comments and criticisms received. Among the international institutions contributing to this document were: FAO, IUCN, OECD, UN-DESA, UNDP, UNEP, UNFPA, WHO and the World Bank, in addition to the Greek Organizing Committee for the Thessaloniki Conference.

5. The scope of the paper reflects the extremely broad scope of chapter 36, which includes formal education at all levels, vocational training in all its forms, non-formal and informal education and communication of information to the general public about sustainable development. Chapter 36 also emphasizes that basic education, as defined by the World Conference on Education for All (Jomtien, 1990), is essential to education for sustainable development and must remain a priority for many countries of the world, linked as it is to their overall efforts to combat poverty and promote economic and social development.

6. This paper is obviously far from complete in terms of all that could be said on this vast subject. It is for this reason that in the preface the Director-General has characterized this work as the "beginning of a process not a conclusion". This first attempt to articulate the key messages of education for sustainable development and to consider its many components will need to be refined over time, with the widest possible discussion and participation to which UNESCO is committed. It is for this reason that the paper has deliberately not been targeted to those already engaged in this field. For these relatively few persons, this document will no doubt appear to "repeat what we already know". But for others engaged in one aspect or another of this broad topic - teachers, government officials, NGOs - or for those not directly connected to education but who are nevertheless prime stakeholders in education for sustainable development - business and industry, financial institutions, the academic community - this paper should open up the broader perspective offered by the concept of education for sustainability. It should also make clear that well-established disciplines such as environmental education and population education have a vital role to play while still maintaining their distinct identities.

7. In embracing the broad scope of chapter 36 and in addressing the priorities laid out in the CSD work programme, there are naturally some areas which are more advanced than others. For example, education for sustainable consumption is still in its infancy. It is for this reason that UNESCO anticipates that, with this document as a start, and building on the results of Thessaloniki as well as those of the many very important national and regional meetings held recently, strategy papers on the different topics dealt with in this paper and for different regions of the world will need to be prepared in the future. UNESCO as Task Manager will continue to facilitate this process.

I. WHAT IS "SUSTAINABILITY"?

8. Most people in the world today have an immediate and intuitive sense of the urgent need to build a sustainable future. They may not be able to provide a precise definition of "sustainable development" or "sustainability" - indeed, even experts debate that issue - but they clearly sense the danger and the need for informed action. They smell the problem in the air; they taste it in their water; they see it in more congested living spaces and blemished landscapes; they read about it in the newspapers and hear about it on radio and television. The stories that carry the message may be about pollution alerts or the bans on driving and closed beaches that result from them, or about hunger and famine, growing health problems such as asthma and allergies, unsafe drinking water, "greenhouse gases" and the threat of global warming and rising ocean levels, the destruction of the world's forests and the expansion of its deserts, the disappearance of species, the large-scale death of fish and birds caused by oil spills and pollution, or about forest fires, floods, dust storms, draughts and other so-called "natural" disasters. Or they may be about many other matters suggesting increasing levels of distress and desperation: inexplicable violence and outbreaks of war, mass migrations, the rise of intolerance and racism, the denial of democratic freedoms, corrupt practices that enrich the few at the expense of the many, rising prices and resource scarcities, growing unemployment and slipping standards of living for many of the world's inhabitants.

9. Even banal accounts of everyday life cause one to pause and reflect: e.g. the need for poor women in developing countries to spend many hours each day searching for wood and water or the plight of the commuter in the developed world whose travel to work is now measured in hours rather than minutes. Are these random events and developments, unrelated to one another, or are they parts of a pattern? Both opinion polls and casual conversations suggest that people are increasingly beginning to sense that something has gone seriously wrong, that there must be some connection among the growing difficulties they encounter and read about, even if they cannot provide an adequate explanation of exactly what it is or how it has developed.

10. For countless millions of people, it is not simply a matter of speculating about causalities; they are already feeling the painful consequences of changing conditions in their daily lives. The situation is most severe for the poor and deprived, but increasingly even the more fortunate are experiencing a growing sense of anxiety and unease, of pending problems and unresolved difficulties. They perceive, for example, that the opportunities open to their children are shrinking even as the problems and challenges facing their societies continue to grow. Providing employment for the young and social security for the old is a growing challenge as populations expand in the developing world and age in the industrialized countries. Yet, if the future looks increasingly problematic, there is no retreating into the past, into time-honoured practices and values, for these, too, have been irreversibly altered by the profound transformation of society in the wake of the industrial and post-industrial revolutions. Attempts to do so usually end in frustration and sometimes in violence and nihilism.

BEHIND THE HEADLINES

11. What lies behind these newspaper headlines and the rising concerns and problems of people around the world? There is evidently no single or easy answer, but it is not difficult to identify some important and interrelate contributing factors:

- the rapid growth of the world's population and its changing distribution,
- the persistence of widespread poverty,
- the growing pressures placed on the environment by the worldwide spread of industry and the use of new and more intensive forms of agriculture,
- the continuing denial of democracy, violations of human rights and the rise of ethnic and religious conflicts and violence, gender inequity, and
- the very notion of "development" itself, what it has come to mean and how it is measured.

12. These factors are probably more accurately regarded as symptoms rather than as causes as they themselves are the consequences of thinking, values and practices in social, economic and political affairs that have put the world on an "unsustainable" path. It is, therefore, not only necessary to deal with the problems discussed below, but even more essential to get our thinking right: to see the interrelations among these problems and recognize the fundamental need to develop a new perspective rooted in the values of sustainability. It is this need which makes education the key to creating a sustainable future.

Population

13. In 1950, the estimated population of the planet was 2.5 billion. By the year 2000, it is projected to grow to more than six billion and by the year 2025 to more than eight billion. Population pressures are undeniably a factor in the degradation of environments. Moreover, population pressures are increasing most rapidly in the regions of the world where resources for coping with the requirements and demands of growing numbers are most limited. Between 1990 and 1995, an estimated 94% of total population growth occurred in the less developed regions and only 6% in the more developed regions. While fertility rates are declining in all major regions of the world in response to improved access to education, health and social services, especially by women, rapid population growth is projected to continue well into the 21st century. By even the most optimistic scenarios, the world's population will nearly double before it stabilizes. The predictable consequences of such growing population pressures, especially in already densely populated and poor countries, include rapid urbanization, possible further reductions in living standards, lower *per capita* investments in education and health and increased environmental distress and degradation. Less predictable outcomes might include a rise in violence or even war, large-scale migrations and escalating poverty and famine. While many of the worst consequences could possibly be avoided by early preventive action, the record of past decades provides little support for optimism or complacency in this regard.

Poverty

14. Poverty is, in part, a consequence of the present pattern of population growth as well as a serious threat to both human dignity and sustainable development. Over a billion people, about a third of the total population of the developing countries, are desperately poor, struggling to survive on less than a dollar a day. Hundreds of millions more live on the threshold of poverty and face the constant risk of sinking below it. People unable to care for themselves can be excused for failing to care for their environment. Necessity drives them to use, and eventually overuse, all the resources at hand: land, water, wood, vegetation and, indeed, anything that can help them to meet their vital needs. Poverty also makes it difficult to mobilize people to work together for common goals, be they healthful environments, food security, jobs or other aspects of sustainable development. Poverty makes the delivery of education and health services more difficult and spurs population growth. Poverty also contributes to much of violence and war which destroy lives and undermine social and economic progress.

15. The solution to poverty must be found not only through economic measures, but also through political and social reforms, as poverty is caused not only by natural scarcities, but also by domination, exploitation and exclusion. Nor can the answer to poverty be sought only through increased production. What is produced, and the employment generated in producing it, must also be more equitably shared. At present, one quarter of the world's population consumes three-quarters of the world's natural resources. For particular resources, petroleum for example, the disparities are even greater: the average consumption of a North American is fifteen times greater than that of an Indian. At the extremes of wealth and deprivation - where the comparison is between individuals, not countries - the disparities defy belief: by one estimate, for example, the wealth of the world's richest 359 individuals equals the annual income of the poorest 2.4 billion people, almost 40% of humankind. Poverty reduction is, at once, an essential goal and indispensable condition for sustainable development.

Environmental degradation

16. The rise of a worldwide industrial civilization during the past century and the parallel development of more intensive forms of agriculture - based on the use of chemical fertilizers, insecticides and herbicides - needed to feed and clothe a rapidly expanding population has placed unprecedented pressures and stresses on the world's ecosystems. The problems and dangers are manifold. In industrialized regions, the combustion of fossil fuels, the "life blood" of modern civilization, is resulting in an acidification of soils which is having a destructive impact on plants, forests and aquatic life in lakes and rivers. The use of fossil fuels is also responsible for the buildup of "greenhouse gases" that are a key factor in global warming which is changing weather patterns and raising ocean levels around the world. Even a modest rise in the earth's average temperature, of say two to three degrees, would result in the inundation of vast amounts of fertile low-lying coastal lands and the disappearance of many islands. A growing dependence on chemicals, many of which have never existed in nature, is having a damaging impact on plants and animals, leading even to the extinction of certain species and thus to a reduction in the world's biodiversity. Chemicals are affecting the stratosphere, depleting ozone and exposing the earth's surface

to higher levels of ultra-violet radiation known to cause skin and other cancers. In the developing countries, land degradation presents perhaps the most immediate and urgent problem. As agricultural land *per capita* diminishes as a result of population growth and urbanization, it becomes essential to preserve the productivity of every available acre.

17. Yet, perhaps the greatest environmental danger lies in problems that are little discussed, even among scientists, such as the impact of human activities on natural "nutrient cycles" required to produce and balance elements essential to life: including carbon, oxygen and nitrogen. While the long-term affects of anthropogenic activities on the environment are either unknown or poorly understood, it is abundantly clear that delicate balances are being disturbed and disrupted. Some of these changes - e.g. the extinction of species - are already irreversible. Other processes may soon pass the point of no return, if action is not taken promptly. Yet, measures to protect the environment are resisted by those who insist that the needs of development - rising living standards for growing numbers - must take precedence over ecological concerns. The challenge of sustainability involves reconciling and adjudicating conflicting claims and moving towards a development which is environmentally sound.

Democracy, human rights and peace

18. It is not only the harm that human beings are doing to nature, but also the injury that they are inflicting upon one another that is at the root of many of the world's problems. While democracy has made impressive progress in many regions, it has faltered in others. Even many "democratic countries", however, do not systematically practice democracy. The votes of the citizens may be counted, but the citizens themselves don't count for much in the operation of society. Inequalities dominate in all sphere of life: in the sharing of wealth, jobs, opportunities and social services, gender discrimination, and, of course, political influence and power. Underdevelopment and poverty are, at once, a cause and a consequence of arbitrary and undemocratic rule. The State, whose duty it is to protect the rule of law, is often the first to disregard it. Human rights are violated and ethnic and religious tensions exacerbated for political or personal gain. The bitter experience of the last decades has been that the failure of development efforts has often been followed by outbreaks of violence and wars between cultural, ethnic and religious communities. Since 1990, more than nine out of ten wars have broken out within countries rather than between them and more than nine out ten casualties have been civilians rather than soldiers. Without peace, there can be no development in any meaningful sense of the term.

Development

19. "Development" itself - what it means and how it is measured - is also an important part of the problem. Standard measures of development, such as gross national product, equate "development" with growth in production and consumption of goods and services. While such measures take into account investment in the means of production, such as the digging of copper mines or the drilling of oil wells, they fail to account for the use and eventual exhaustion of the precious capital represented by the world's endowment of

natural resources. Nor, until quite recently, have economists adequately recognized that the capabilities embodied in women and men through education, experience and training are, in fact, the most essential "means of production".

20. Many economic measures fail on other scores as well. While they carefully account for productive outcomes, they treat the emission of smoke, gases and other pollutants, not as costs, but simply as "externalities". This is so because society as a whole, not the polluter, bears the cost and burden of coping with the problem. National accounts also fail to reflect what is done out of love or duty rather than for profit, thereby deeply discounting the indispensable work that women have always done - and continue to do - for their families and in and about their homes. In addition, the focus of economics on the "immediate present" is seriously at odds with the need to consider the long-term well-being of the environment. In addition, while economic costs are viewed as incremental and linear, the impact of economic activity on the environment is cumulative and subject to sudden and possibly irreversible changes. The traditional visions of the economist and the ecologist are thus fundamentally at odds. Fortunately, a search for common understanding is underway.

21. Yet, perhaps the greatest problem arises from the automatic equation of higher levels of production - and by implication, consumption - with "development". Economists, and everyone else as well, recognize that this is at best a half truth. What is produced and, especially what it is used for, is every bit as important as how much of it is turned out. An added dollar of consumption, which doubles the daily income of an impoverished individual, evidently serves a very different purpose than the negligible addition of a dollar of purchasing power to the income of a millionaire. Yet, the automatic equation of a single technical measure of "development", usually GNP, with the society's overall progress and well-being is pervasive. It is part of an overall 20th century mind set that means are more important than ends, levels of activity more important than the purposes served.

22. Increasingly, developing nations set themselves the goal of "catching up" with Europe, Japan or the United States in levels of GNP *per capita*. It is necessary, however, to reflect that for all countries to achieve the current level of production of the most industrialized countries, worldwide consumption of natural resources would have to increase three-fold. Comparable increases would occur in the emission of pollutants and other perverse effects of production, assuming the newly industrializing countries make the same investment in controlling emissions as is presently done in the most industrialized countries. It may, however, be unrealistic to expect them to do so while urgent social needs are still unmet. The challenge is to find means and measures that assist the developing countries to meet the basic needs of their people without inflicting irreversible damage on their environment.

23. In pursuing this objective, measures of development such as the UNDP's Human Development Index, which seeks to take account of the many dimensions of human well-being, would be extremely helpful in focusing attention on the ends that development must serve rather than on means, such as increased production, alone.

Interdependence

24. None of the factors discussed above can be examined or acted upon in isolation from the others. They are in constant interaction. Violence, for example, is, at once, a cause of poverty and its consequence. Growing populations place increasing stress on ecosystems, but human activity by contributing to climate change further intensifies population pressures through desertification and rising ocean levels. The issues, moreover, are not only related to one another in a physical manner, but also in a psychological sense. How people think about the issues - their knowledge, beliefs, attitudes and especially their values - is as important in the search for solutions as the "objective realities" confronted.

25. It is also essential to take account of the varying circumstances in which people around the world find themselves and the impact of their situation upon their priorities and values. To an individual living in rural poverty in the developing world, "sustainable development", if it is to make any sense, must mean increased consumption and a higher living standard. By contrast, to an individual in a wealthy country, with a closet full of clothes, a pantry full of food and a garage full of cars, "sustainable development" could mean more modest and carefully considered consumption. Similarly, the issue of inter-generational parity and justice, inherent in discussions of sustainable development, will raise very different questions and choices in a country with a rapidly growing population, nearly half of which is under twenty years of age, than in a country with a stable and aging population.

26. In sum, the puzzle of sustainable development cannot be solved by concentrating on the pieces. It has to be seen as a whole - in both its scientific and social dimensions - not as a series of isolated issues and problems. In the final analysis, sustainable development is humanity's response to an emerging global challenge and crisis.

NORTH-SOUTH DIFFERENCES

27. Any discussion of sustainable development has to take account of both the disparities between rich and poor nations and, equally important, what these differences imply for policy formulation. Policies appropriate to the north make little sense for the south and vice versa.

28. The major challenge facing the developing nations of the south is that of significantly increasing productivity and output to overcome poverty and deprivation. Until this is achieved, at least in part, it is unrealistic to expect the environmental standards that apply in the north to be adopted in the south as well. So long as poverty is widespread, the south will be tempted - and often compelled - to accept higher levels of pollution and lower levels of control, just as the highly industrialized countries of today did until relatively recently.

29. One of the tasks of education for sustainable development, especially in northern countries, will be to explain why these differences exist and why, at least for the time being, the application of equal standards would result in very inequitable outcomes. The north can, of course, help to shorten the interval in which lower standards will be

necessary by assisting the south in its development efforts, especially, as concerns education, in the development of its schools, universities and training programmes for scientists and other key personnel through financial and technical assistance, sharing of knowledge, and the training of experts from the south in their institutes and universities.

30. There are, of course, many similarities as well as differences. Many of the emerging issues - e.g., the need for renewal energies and fresh water - affect all regions of the world in varying degrees. A major challenge of education for sustainable development in all countries is that of helping people to understand and adapt to a pace of change which is, as yet, "unnatural" to all cultures. In a deeper sense, as neighbours on the same planet our destinies are ultimately joined.

TOWARDS A DEFINITION OF SUSTAINABILITY

31. Sustainable development has been variously defined and described. It is not a fixed notion, but rather a process of change in the relationships between social, economic and natural systems and processes. The World Commission on Environment and Development, for example, defined sustainable development in terms of the present and the future: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Other definitions have extended the notion of equity between the present and the future, to equity between countries and continents, races and classes, genders and ages.

32. Perhaps the most widely used definitions focus on the relationship between social development and economic opportunity, on the one hand, and the requirements of the environment on the other: i.e., on improving the quality of life for all, especially of the poor and deprived, within the carrying capacity of supporting ecosystems. This does not necessarily set fixed limits on "development", but rather recognizes that the prevailing notions and definitions of development must themselves evolve in relation to changing requirements and possibilities. *Caring for the Earth* (IUCN, 1991), for example, notes that a sustainable economy "can continue to develop by adapting, and through improvements in knowledge, organisation, technical efficiency and wisdom". In brief, sustainability calls for a dynamic balance among many factors, including the social, cultural and economic requirements of humankind and the imperative need to safeguard the natural environment of which humanity is a part. What is sought is the condition of "human security" for all people.

A dynamic balance

33. Sustainability, in effect, involves an equation between environmental requirements and development needs. It can be balanced by acting either to reduce stresses or to increase "carrying capacities". The argument between ecologists and economists has been that the former have stressed the first course of action and the economists the latter. It is evident that in a crisis, both possibilities have to be carefully explored. There are environmental strains, such as the multiplying of populations, that at some point become incompatible with both the maintenance of the environment and the quality of life. By the

year 2030, for example, it is projected that there will be three billion more people on earth than today. The task of feeding, clothing and sheltering them will be enormous, that of providing them with education, employment, security and a minimum of well-being and satisfaction vastly greater still. These facts of life must not be ignored. But neither should the capacity of humanity to find and invent solutions be overlooked or minimized.

34. The higher levels of production required by three billion additional people will certainly inflict serious damage upon the environment unless modes of production change significantly in the coming decades. Fortunately, this is what is happening. As this document is being prepared, the invention of a fuel cell has been announced that, it is claimed, is capable of directly converting hydrocarbons, such as gasoline, into electricity, with nearly twice the efficiency of an internal combustion engine and without the production of carbon-dioxide or other pollutants. Within ten to twenty years, the introduction of automobiles, buses and trucks powered by such fuel cells is expected to substantially improve air quality in large cities of industrialized countries. Whether the cost of this new technology will be affordable in the developing regions of the world in the near future is of central importance and, as yet, unclear. Of greater relevance to developing countries, major breakthroughs are being made in agriculture which allow farmers to produce more food on less land while reducing the impact on the environment. Moreover, the widening use of computers and the growing reach of the new information and communication technologies are ensuring a far more rapid and wider dissemination and application of innovations than was the case even a decade ago.

35. While such developments are highly encouraging, it would be imprudent to expect science and technology to find a solution to every problem that humanity is capable of creating for itself. Nor would it be wise to rely on technical solutions alone without considering the capacity of human societies to adjust to the changes and stresses that they may impose. But it would be equally short-sighted to overlook the capacity of people to invent solutions to problems or to find ingenious ways of coping with such problems. The concept of sustainable development is informed by both the warnings of environmentalists and the arguments of economists in favour of development. It seeks to strike a realistic balance between dangers and possibilities, hopes and fears, aspirations and constraints. The "point of balance" is, of course, influenced by many factors and, thus, subject to constant change.

An emerging vision

36. Yet, while there are many definitions of sustainable development, it can perhaps be better understood as an emerging vision rather than as a neatly defined concept or relationship. In truth, it is as much an ethical precept as a scientific concept, as concerned with notions of equity as with theories of global warming. Sustainable development is widely understood to involve the natural sciences and economics, but it is even more fundamentally concerned with culture: with the values people hold and how they perceive their relations with others. It responds to an imperative need to imagine a new basis for relationships among peoples and with the habitat that sustains human life.

37. Its strength is that it frankly acknowledges the interdependence of human needs and environmental requirements. In so doing, it rejects the single-minded pursuit of one objective at the cost of others. A heedless pursuit of "development", for example, can not be accepted at the cost of inflicting irreparable damage on the environment. But neither can the preservation of the environment be achieved at the cost of maintaining half of humanity in poverty. Or, in the terms in which the debate is sometimes posed, we cannot sacrifice people to save elephants, but neither can we - at least not for very long - save the people by sacrificing the elephants. Indeed, this is a false dichotomy that must be rejected. We must imagine a new and sustainable relationship between humanity and its habitat: one that places humanity at centre stage, but does not neglect that what is happening in the "wings" may turn the drama of everyday life into an ancient Greek tragedy in which we see a terrible fate approaching, but can muster up neither the collective will nor common means to escape it.

EDUCATION: THE FORCE OF THE FUTURE

38. It is widely agreed that education is the most effective means that society possesses for confronting the challenges of the future. Indeed, education will shape the world of tomorrow. Progress increasingly depends upon the products of educated minds: upon research, invention, innovation and adaptation. Of course, educated minds and instincts are needed not only in laboratories and research institutes, but in every walk of life. Indeed, access to education is the *sine qua non* for effective participation in the life of the modern world at all levels. Education, to be certain, is not the whole answer to every problem. But education, in its broadest sense, must be a vital part of all efforts to imagine and create new relations among people and to foster greater respect for the needs of the environment.

39. Education must not be equated with schooling or formal education alone. It includes non-formal and informal modes of instruction and learning as well, including traditional learning acquired in the home and community. By defining education broadly, one also widens the community of educators, as the programme statement of *Education 21* promoted within the United Kingdom notes, to include "teachers, lecturers, curriculum developers, administrators, support staff, industrial trainers, countryside rangers and staff, environmental health and planning officers, education officers with NGOs, community educators, youth leaders, parent association members, media people, representatives of learners in all contexts - and yet more." One might further widen this community to include all those, whatever their role in society, who perceive a need or duty to inform and educate people regarding the requirements of a sustainable future. International organizations, government departments and institutions, foundations and many others are deeply involved in education in the broad sense of the term used here. Many firms in the private sector also seed the need to play their part in promoting awareness and are doing so in innovative ways: for example, through sponsoring the publication of articles in newspapers and journals exploring environmental and social issues. This vast community of educators represents an enormously potent, but largely untapped human-resource for sustainable development that can be invaluable in a range of contexts as well as education. It represents, above all, a means for bringing the struggle for sustainable

development into communities and local institutions around the world which, in the final analysis, is where the cause of sustainable development will either triumph or fail. .

40. Education serves society in a variety of ways. The goal of education is to make people wiser, more knowledgeable, better informed, ethical, responsible, critical and capable of continuing to learn. Were all people to possess such abilities and qualities, the world's problems would not be automatically solved, but the means and the will to address them would be at hand. Education also serves society by providing a critical reflection on the world, especially its failings and injustices, and by promoting greater consciousness and awareness, exploring new visions and concepts, and inventing new techniques and tools. Education is also the means for disseminating knowledge and developing skills, for bringing about desired changes in behaviours, values and lifestyles, and for promoting public support for the continuing and fundamental changes that will be required if humanity is to alter its course, leaving the familiar path that is leading towards growing difficulties and possible catastrophe, and starting the uphill climb towards sustainability. Education, in short, is humanity's best hope and most effective means in the quest to achieve sustainable development.

II. PUBLIC AWARENESS AND UNDERSTANDING: THE FUEL FOR CHANGE

41. Awareness is a prelude to informed action. In democratic societies, action towards sustainable development will ultimately depend on public awareness, understanding and support. Common information and shared understandings, however, are important not only for mobilizing public support, but also for carrying out work consultative and participatory approaches in all fields.

42. Public awareness and understanding are, at once, consequences of education and influences on the educational process. A public well informed of the need for sustainable development will insist that public educational institutions include in their curricula the scientific and other subject matters needed to enable people to participate effectively in the numerous activities directed towards achieving sustainable development. The students that emerge from such courses will, for their part, be alert to the need for public authorities to make adequate provision for the protection of the environment in all development plans. Education is particularly important in developing a "taste for knowledge".

43. Perhaps the greatest problem that advocates of sustainable development face is to convince not only those who are opposed to their ideas, but also those who simply "don't want to know". An approach that emphasizes local issues, rather than global ones, is likely to be most effective in dealing with this constituency. This may account, in part, for the success of non-formal community education and local environmental communication programmes in reaching and sensitizing people to environmental and development issues in both developing and industrialized countries. A particular benefit of such programmes is that they are often directly linked to action to control or solve the problems identified.

THE NEED FOR EFFECTIVE COMMUNICATION

44. Advocates of sustainable development and the environmentalists who proceeded them have learned much about how to communicate effectively. Initially, their emphasis was on "getting the science right" with little thought given to how to communicate findings and make them meaningful to a wide and non-technical public. It was assumed that the facts would speak for themselves. Sadly, it didn't prove that easy.

45. It is important to explore the difficulties that arose in order that they may be avoided in the future. There are several sorts of problems: the influence of vested interests, the neglect or inadequacy of communication strategies, the complexity of the messages and the unfortunate tendency of some of the messengers to spend more time squabbling with one another than communicating with the public.

CONFRONTING VESTED INTERESTS

46. In any struggle - including one to win over the minds of the public - it is important to understand the motives and strengths of those on the other side of the issue. Naively, one might imagine that few would find reason to oppose measures necessary to avoid potentially calamitous consequences for humanity. But, alas, what is good for humanity in general may nonetheless be costly and inconvenient to particular individuals, groups and other vested interests. The electrical power industry, to cite a current example, is vigorously against more stringent controls on the emission of "greenhouse gases", even though there is convincing and growing evidence - if not yet certainty - that the build-up of such gases in the atmosphere is leading to global warming and all that could ensue from it. Regulation is not going to come about on the basis of the evidence alone. Public mobilization and vigilance are essential, if effective measures are to be enacted into law and enforced.

47. Until quite recently, advocates of the common interest have had difficulty mustering the needed public relations expertise and support to overcome the influence of vested interests. Fortunately, in the past two decades, many lessons have been learned, especially by environmentalists, on how to convert a growing public concern for the state of earth into effective support for specific measures to address concrete problems. Yet, in most countries, while environmental issues are now receiving greater support, measures aimed at promoting population policies, social development, poverty reduction and other necessary measures for achieving sustainable patterns of development continue to be largely ignored by the general public. Ultimately, though, there can be no solution to environmental problems unless the social and economic ills besetting humankind are seriously addressed. It is this broader message and reality which remains to be effectively communicated to and internalized by the public.

48. Debate and defence of particular interests are, of course, inherent in the democratic process. Vested interests have to be overcome by democratic means: namely, by more effective mobilization of public opinion aimed at gaining support at all levels: international, national and local. The difficulties in achieving this goal should not, however, be under-estimated. As can be seen in the discussions about implementation

of the Convention on Climate Change, the opposition comes not only from particular industrial interests, but also from countries and groups of countries. While nobody favours pollution per se, many countries would nonetheless like to exempt themselves or others from bearing the cost of stringent controls. A vigilant and informed world public represents a powerful counterweight to the vested interests that appear, at present, to have the upper hand on many issues. It is no accident that the countries that are militating most strongly for controls on emissions and other environmental measures are the same nations that have strong environmental lobbies and publics committed to action - locally, nationally and internationally - to preserve the environment.

COMMUNICATION STRATEGIES

49. One of the lessons of recent experience is the need to establish effective communication strategies as an integral part of any major scientific inquiry or programme. A comparison, which highlights this need, can be made between the National Acid Precipitation Assessment Project (NAPAP) in the United States and the Intergovernmental Panel on Climate Change (IPCC) established in 1988 by the United Nations Environmental Programme (UNEP) and the World Meteorological Organization (WMO). NAPAP, while it was highly regarded by scientists, had virtually no communication strategy. As a result, while its research and recommendations were well considered, there has been little follow-up action. IPCC has sought to avoid this failure by keeping both the scientific community and the general public systematically informed of its work and findings from the very start. It has also sought, with considerable success, to build bridges to policy-makers in order that they be aware of and able to reflect upon the implications of the panel's emerging findings. By informing the public, IPCC has made it much more difficult to simply sweep its conclusions under the carpet. The lesson here is that communication has to be seen as a long-term interactive process strategically aimed at particular groups and audiences, not as a concluding message when a project or panel is about to present its final report and wind up its activities. It is not necessary - or even desirable - for scientists to become propagandists, but it is essential that studies conducted in the public interest have adequate means to communicate their findings to the public on whose behalf they were carried out.

COMPLEX MESSAGES

50. The messages of sustainable development represent a challenge in and of themselves. Rather than being simple and unambiguous - thus easy to communicate - environmental and developmental issues tend to be complex. This is so because of the inherent complexity of ecological and human systems. They defy simplistic explanations, solutions and predictions. Some scientists, for example, expect that the build-up of greenhouse gases that causes global warming may, initially, result in a several decades of falling temperatures in particular regions of the world because of the affect of the melting of the polar ice caps in slowing or stopping the warm ocean currents. This contention may or may not be correct. There is great uncertainty about what may happen, even if there is a general consensus that it won't be favourable to life

on earth. Yet, the ambiguity of the situation makes it hard to explain to non-specialists. To the general public, hot and cold are opposites, even if to the climate scientists they are merely different manifestations of environmental stress. To urge people to beware of global warming, but to keep both their woollens and their beachwear handy, just in case, is in no way convincing. Such uncertainty suggests that global warming may be more speculative than scientific. This, evidently, is not the case. The truth is that complex realities are difficult to communicate in simple messages. Yet, attempts to simplify what, by its very nature is not simple, may result in further confusion and misunderstandings and, ultimately, in lack of credibility.

51. The same problems arise, although to a lesser degree, in dealing with major transformations such as population growth and urbanization. For example, the projection that by the middle of the next century several cities in the developing world may have populations approaching, or even exceeding, 50 million may be accepted matter-of-factly without due reflection on what is involved in managing an urban centre on such a scale or what the quality of life might be for its inhabitants. Thus, while the statement may appear easily understandable, the problems and issues that it raises may go undetected or be seriously under-estimated. The fact is that people have difficulty adjusting from the scale of things encountered in everyday life to the scales of magnitude - enormously large and infinitesimally small - needed to understand demographic or ecological phenomena. Ultimately, a solution can be found only by educating the public in the developmental and environmental "facts of life". Indeed, in the 21st century, the literacies of science, ecology and development will be as essential to comprehending the world as were the traditional skills of reading and writing at the start of the present century.

52. In the meantime, it will be important for those advocating sustainable development to choose, wherever possible, those cases and examples that are most easily understood by the general public. For example, air pollution is, if not always visible, often capable of being smelled and tasted. Closed beaches are plausible evidence of the pollution of rivers, lakes and seas. Even if one wishes, or is compelled, to go on to discuss complex issues such as global warming, it is well to begin with the evidence at hand: car, bus and truck exhaust, smoke stacks, etc. Health issues also are readily understood by the general public: allergies, asthma, and bronchial infections are widely accepted as consequences of deteriorating air quality. Average citizens may not gain a perfect understanding of global warming from such evidence - even scientists don't have that - but their common sense will tell them that what harms their environments and health is capable of doing even greater damage on a global scale. The basic dictum of pedagogy is to begin where the learner is. This is also good advice for the communication specialist. Start with problems that people feel and understand at the local level. That is both valuable knowledge in itself and, if need be, a basis for moving on to more complex and global understandings.

THE MESSENGERS

53. Emotionalism and exaggeration are another frequent source of difficulty. The press is understandably drawn to those with the most extreme views: e.g., to ecological

fundamentalists who will accept no compromise or individuals who possess an apocalyptic vision of the future. Disagreements and quarrels between specialists are also "newsworthy" and are skillfully exploited by the opponents of reform proposals to suggest that the evidence supporting them is weak and confused. More moderate and reasoned voices often go unheard in the din. Extreme positions, while they may be useful in catching the public's attention and alerting it to pending dangers, make it difficult to move from declarations and debate into action.

54. It has to be recognized that neither individuals nor societies are ready or even able to change their habits and behaviours from one day to the next. Proposals for change, if they are to be effective, have to be feasible. Both the messages and the messengers have to appear credible and responsible. Nothing is to be gained by scaring people. Alarmist predictions that make it seem that the world is about to end are evidently not conducive to the long-term planning and action that sustainable development requires. On the contrary, it is far more effective to present problems as manageable through responsible conduct and, wherever possible, put forward a realistic solution and a means to take preventive action.

REASON FOR OPTIMISM

55. This section has focused upon selected problems encountered in raising public awareness on a complex issue such as sustainable development and the many concerns that it subsumes. Yet, while these problems are important and need to be addressed, there is abundant reason for optimism. People are becoming increasingly concerned about the crises afflicting the environment and impeding development. This is, in part, because communication on such issues has become more effective and focused, but mainly because these problems - especially those concerned with the environment - are increasingly impinging on people's lives: their health, their comfort and their hopes for the future. Scientific data alone have rarely won an argument when people were not ready to accept its conclusions and, equally rarely, have scientific findings lost an argument in which people had an intuitive sense that the data were right and relevant. The climate of opinion is changing and becoming more favourable to the promotion of sustainable development.

56. This is not an opportunity to be wasted, but a chance to be seized. To do so will require effective leadership - not in the sense of direction from above - but in the form of responsibility and responsiveness. There is also an important role for the press and media in responding and building upon the growing interest of the public in sustainable development concerns. Evidently, the fullest possible use must be made of the new information and communication media, but traditional and folk media must also be creatively employed. The messages of ancient cultures on sustainable development often took the form of metaphors and analogies. These are still powerful means of communicating, especially with poor peoples who are often little schooled, but very much in tune with their culture. The greatest challenge is precisely that of reaching the more than one billion people who live in poverty and deprivation, often in remote rural regions, urban slums and refugee camps.

III. REORIENTING EDUCATION TO SUPPORT SUSTAINABILITY

57. "Until recently, the planet was a large world in which human activities and their effects were neatly compartmentalized within nations..and within broad areas of concern (environmental, economic, social). These compartments have begun to dissolve. This applies in particular to the various global 'crises' that have seized public concern.. These are not separate crises: an environmental crisis, a development crisis, an energy crisis. They are all one." (World Commission on Environment and Development, 1987)

58. Reorienting education to sustainability requires recognizing that traditional compartments and categories can no longer remain in isolation from each other and that we must work increasingly at the interface of disciplines in order to address the complex problems of today's world. This is true both within education, where interdisciplinarity is slowly and with difficulty gaining ground, and between the spheres of education, work and leisure as lifelong learning emerges as a key concept for planning and developing educational systems. It is also true as concerns the most important boundary of all: that separating those included in education systems from those who are excluded from them. These changes are not occurring nearly as rapidly as would be desired, but they are nonetheless taking shape within education at all levels.

59. Ultimately, sustainable development will require an education that not only continues throughout life, but is also as broad as life itself, an education that serves all people, draws upon all domains of knowledge and seeks to integrate learning into all of life's major activities. The time when education was the activity of childhood and work the pursuit of adults is long over. The rapid growth of knowledge has rendered the notion of schooling as a "once and for all" preparation for life utterly obsolete. The growth of knowledge is advancing exponentially, yet not nearly as fast as the need for understanding and solutions at which it is aimed. As concerns sustainable development specifically, it is impossible to predict with reliability what will be the key issues on which people will need information in five, ten, twenty or fifty years. It is predictable, however, that such developments will not fit neatly into the existing and artificial sub-divisions of knowledge which have been in place for more than a century. Hence, understanding and solving complex problems is likely to require intensified co-operation among scientific fields as well as between the pure sciences and the social sciences. Reorienting education to sustainable development will, in short, require important, even dramatic changes, in nearly all areas.

60. The importance of education was underscored at the at the nineteenth Special Session of the General Assembly (23-27 June 1997) convened to review the implementation of Agenda 21 five years after Rio. The resolution adopted by the session emphasized that a "fundamental prerequisite for sustainable development is an adequately financed and effective educational system at all levels, particularly the primary and secondary levels, that is accessible to all and that augments both human capacity and well-being. ..Even in countries with strong educational systems," the resolution continues, "there is a need to reorient education, awareness and training to increase widespread public understanding, critical analysis and support for sustainable development. Education for a sustainable future should engage a wide spectrum of institutions and sectors..and should include the preparation of sustainable development education plans and

programmes". In the sections that follow, a number of key issues relating to education's role in sustainable development will be briefly examined.

IMPORTANCE OF BASIC EDUCATION

61. Inherent in the concept of sustainability is the vision of a more equitable world. This can only be achieved by providing the disadvantaged with the means to advance themselves and their families. And of these means, the most essential is education, particularly basic education. Over 100 million children between the ages of 6 and 11 never attend school and tens of millions more enter school only to drop out within a few months or years. Moreover, there are over 800 million illiterate adults, most of whom have never been enrolled in school. The first requirement in the quest for development and equity must be to change this situation and make schooling of quality available to all. But that goal, alas, is still far off. For the present, the challenge is to make the best of an unfortunate and unjust situation.

62. The World Conference on Education for All used the term "basic education" to refer to all forms of organized education and training that meet the basic learning needs of individuals, including literacy and numeracy, as well as the general knowledge, skills, values and attitudes that they require to survive, develop their capacities, live and work in dignity, improve the quality of their lives, make informed decisions and continue learning. The Conference consciously choose to define education in terms of learning outcomes rather than levels of instruction.

63. Given the situation today in many developing countries, it does not suffice to orient formal education towards sustainability. Attention also has to be given to those who are presently unserved or poorly served by schools. This is a large group, well over a billion people, and a vital one for the future. Girls and women, the mothers of today and tomorrow, are in the majority. They are, or will be, the first and most influential teachers of their children. The goals of educating young children are focused on ensuring their health, development, happiness, well-being and adjustment to the environment in which they live. If these goals are not achieved, the future of the child is compromised and the prospects of sustainable development diminished.

64. Basic education provides the foundation for all future education and learning. Its goal, as concerns those in the pre-school primary school-age population, whether enrolled in school or not, is to produce children who are happy with themselves and with others, who find learning exciting and develop inquiring minds, who begin to build up a storehouse of knowledge about the world and, more importantly, an approach to seeking knowledge that they can use and develop throughout their lives. Basic education is aimed at all the essential goals of education: learning to know, to do, to be (i.e., to assume one's duties and responsibilities) and to live together with others, as outlined in *Education: the Treasure Within*, the report of the Independent Commission on Education for the Twenty-first Century Report published in 1996 by UNESCO. It is, thus, not only the foundation for lifelong learning, but also the foundation for sustainable development.

65. Basic education for adults is aimed at empowerment. It is, in the words of the Amman Affirmation, the document summing up the mid-decade review of progress towards Education for All, "...the key to establishing and reinforcing democracy, to development which is both sustainable and humane and to peace founded upon mutual respect and social justice. Indeed in a world in which creativity and knowledge play an ever greater role, the right to education is nothing less than the right to participate in the life of the modern world." In sum, if our vision of the future is a world based on democracy, striving to achieve greater social justice and economic opportunity, and concerned to improve the quality of life and preserve the environment, then basic education has to be the first order of business, for it holds the power to contribute to all of these goals by enabling people to take their destinies into their own hands and play their role in shaping the common destiny of humanity. Sustainable development cannot be achieved by a small minority on behalf of the vast majority. It will require the contribution and commitment of each and all. That is why it is essential to give all people the means - starting with basic education - to participate in shaping a sustainable future.

WHAT CHANGES DOES SUSTAINABILITY REQUIRE?

66. In spite of the considerable progress which has been made, there are still enormous barriers to reorientation of formal education to sustainability, barriers that cannot be addressed by the efforts of individual teachers or even schools, no matter how committed they might be. Effectively overcoming such barriers requires commitment by society as a whole to sustainable development. Such commitment would involve all of society's stakeholders to work collaboratively and in partnership, including industry, business, grassroots organizations and members of the public, to develop policies and processes which integrate social, economic, cultural, political and conservation goals. A sustainable society will be one in which all aspects of civic and personal life are compatible with sustainable development and all government departments at all levels of government work together to advance such a society.

67. Education plays a dual role, at once in both reproducing certain aspects of current society and preparing students to transform society for the future. These roles are not necessarily mutually exclusive. However, without commitment of all of society to sustainable development, curricula have tended in the past to reproduce an unsustainable culture with intensified environment and development problems rather than empower citizens to think and work towards their solution. The role of formal education in building society is to help students to determine what is best to conserve in their cultural, economic and natural heritage and to nurture values and strategies for attaining sustainability in their local communities while contributing at the same time to national and global goals.

Curriculum reform

68. To advance such goals, a curriculum reoriented towards sustainability would place the notion of citizenship among its primary objectives. This would require a revision of many existing curricula and the development of objectives and content themes, and teaching, learning and assessment processes that emphasize moral virtues, ethical

motivation and ability to work with others to help build a sustainable future. Viewing education for sustainability as a contribution to a politically literate society is central to the reformulation of education and calls for a “new generation” of theorizing and practice in education and a rethinking of many familiar approaches, including within environmental education.

69. Education for sustainability calls for a balanced approach which avoids undue emphasis on changes in individual lifestyles. It has to be recognized that many of the world’s problems, including environmental problems, are related to our ways of living, and that solutions imply transforming the social conditions of human life as well as changes in individual lifestyles. This draws attention to the economic and political structures which cause poverty and other forms of social injustice and foster unsustainable practices. It also draws attention to the need for students to learn the many processes for solving these problems through a broad and comprehensive education related not only to mastery of different subject matters, but equally to discovering real world problems of their society and the requirements for changing them.

70. This kind of orientation would require, *inter alia*, increased attention to the humanities and social sciences in the curriculum. The natural sciences provide important abstract knowledge of the world but, of themselves, do not contribute to the values and attitudes that must be the foundation of sustainable development. Even increased study of ecology is not sufficient to reorient education towards sustainability. Even though ecology has been described by some as the foundation discipline of environmental education, studies of the biophysical and geophysical work are a necessary - but not sufficient - prerequisite to understanding sustainability. The traditional primacy of nature study, and the often apolitical contexts in which is taught, need to be balanced with the study of social sciences and humanities. Learning about the interactions of ecological processes would then be associated with market forces, cultural values, equitable decision-making, government action and the environmental impacts of human activities in a holistic interdependent manner.

71. A reaffirmation of the contribution of education to society means that the central goals of education must include helping students learn how to identify elements of unsustainable development that concern them and how to address them. Students need to learn how to reflect critically on their place in the world and to consider what sustainability means to them and their communities. They need to practice envisioning alternative ways of development and living, evaluating alternative visions, learning how to negotiate and justify choices between visions, and making plans for achieving desired ones, and participating in community life to bring such visions into effect. These are the skills and abilities which underlie good citizenship, and make education for sustainability part of a process of building an informed, concerned and active populace. In this way, education for sustainability contributes to education for democracy and peace.

Structural reform

72. Reorienting the curriculum towards sustainable development requires at least two major structural reforms in education. The first is to re-examine the centralized mandating

of courses and textbooks in order to allow for locally relevant learning programmes. Local decision-making can be facilitated through the reform of centralized educational policies and curricula, and the formulation of appropriate syllabuses and assessment policies. Nationally-endorsed syllabuses can serve as "broad framework documents" which provide aims and general objectives for subjects, an overview of broad content themes, appropriate learning experiences, relevant resource materials, and criteria for assessing student learning. This type of syllabus can provide centralized accountability, while allowing schools, teachers and students to make choices about the specific learning experience, the relative depth and breadth of treatment for different topics, the case studies and educational resources used, and how to assess student achievements.

73. A second major area of structural reform is the development of new ways to assess the processes and outcomes of learning. Such reform should be inspired by what people want from their educational system, as well as what society needs. The period of profound change in which we are living needs to be taken into account by educational systems, which were, for the most part, designed to serve a society which is fast becoming history. Learning needs to be seen as a lifelong process which empowers people to live useful and productive lives. The reorientation of education along these lines - and in anticipation to the extent possible of future needs - is fundamental for sustainable development, including its ultimate objective not only of human survival but especially of human well-being and happiness. Similarly, there also needs to be a revamping of the methods of credentialing students. The various ways in which students are judged (testing, report cards, evaluations) and the basis for awarding diplomas at all levels need to reflect the reformulation of outcomes of learning towards sustainability.

EDUCATIONAL REFORM: A CASE STUDY

74. What does reorienting education towards sustainability mean in practical terms? This is the question that educators immediately want to know. Does it mean adding courses to an already overweight curriculum? Will it require new teaching approaches and methods? New physical facilities, equipment and textbooks to be purchased from an already severely pinched budget? Is it something that can be achieved in a month, a school year or several years? While the reform of education in this direction is still more talked about than put into practice, there are examples emerging which shed light on how to move in this direction.

75. One example is that of the Toronto (Canada) Board of Education which recently undertook a reform of its curriculum through a massive community consultation. Thousands of parents, students, staff and members of the public contributed to full day community consultations aimed at exploring how education should respond to the demands of a changing world. The focus of the inquiry was the question "What should students know, do and value by the time they graduate from school?". Although the notion of "sustainability" was not imposed, it emerged as an essential requirement in the course of the consultation.

76. The education that parents and the community wanted for their children was in many respects hardly revolutionary or even surprising. The six graduation outcomes specified

were: literacy; aesthetic appreciation and creativity; communication and collaboration; information management; responsible citizenship; and personal life skills, values and actions. These differ from most traditional curricular objectives in that they are broader and more closely related to the needs and organization of life than to the requirements and structures of schooling.

77. The essence of the Toronto reform is that the curriculum is no longer focused exclusively on the traditional core subjects of language, mathematics, history, etc. Informed by the new vision of what the community felt tomorrow's students would need to know and be able to do, these disciplines underwent major revision. Mathematics, for example, now includes the skill of comprehending extremely large and extremely small numbers - e.g., ppm and ppb - which are essential to being environmentally literate and capable of understanding relative risk factors both in personal life and at work. Health now includes environmental issues including cancer, allergies and food additives as well as "consumerism".

78. Much of the success of the Toronto reform is due to the fact that it was not - and was not seen to be - an effort to change education to meet goals set by an elite or unduly influenced by outside pressures. The impetus to change came from within. The new curriculum had equal or greater academic rigour, but far greater relevance to life outside school walls. What it demonstrates is that education for sustainable development is simply good education, and that good education needs to make children aware of the growing interdependence of life on earth - interdependence among peoples and among natural systems - in order to prepare them for the future.

79. Toronto had one great advantage in implementing its curriculum reform: well-educated and well-trained teachers. In reality, what students learn is not necessarily what is written in the syllabus; it is what the teacher delivers in the classrooms. By far, the most frequent cause of curriculum failure is inadequate teacher training. In Toronto the development of the curriculum itself constituted an informal type of training in which thousands of teachers were involved. This was followed up by more formalized sessions and by systematic provision for teachers to upgrade their qualification through university courses and other forms of training. The lesson in this is that efforts to adapt education systems to sustainable development have to consider not only the question, "what are the essential messages that must be delivered?", but also and equally, that of "how will teachers be trained to put those messages across powerfully and effectively?".

80. In general, reforms aimed at sustainability will require much more of teachers than do traditional curricula. Students will have to be more actively involved in individual and collective activities. This will require teachers to play new roles which, in turn, implies a need for increased training and support. Educational reforms, like the movement towards sustainable development itself, requires holistic and systematic thinking; piecemeal approaches will not suffice and can not produce the required results.

REFORM AT DIFFERENT SCALES

81. It must, of course, be recognized that curriculum reform can take place in different ways and on different scales. If schools are granted greater autonomy, as proposed above, significant reforms could take place within schools or even classrooms, rather than at the national, provincial or district levels. Certain of these reforms would be aimed at changes in particular lessons or courses rather than for the curriculum as a whole. Such reforms would not be sufficient to fully orient the curriculum towards sustainability, but they could nonetheless be highly valuable. It is also necessary to recognize that schools and school systems in many developing countries are struggling under enormous burdens. They have insufficient resources to implement their present programmes of study - often only four or five textbooks are available for a class of fifty or more - and no means to aim at the more ambitious objectives that were possible in Toronto and in other industrialized countries. This inequality in educational resources and, hence in opportunities, is itself one of the major causes of unsustainability. If schools are to be a means to the reform of society, it is then essential that society at all levels - local, national and international - invest adequate attention and resources in its schools.

CONTRIBUTION OF ENVIRONMENTAL EDUCATION

82. It is clear that the roots of education for sustainable development are firmly planted in environmental education. While environmental education is not the only discipline with a strong role to play in the reorienting process, it is an important ally. In its brief twenty-five year history, environmental education has steadily striven towards goals and outcomes similar and comparable to those inherent in the concept of sustainability.

83. In the early 1970s, the emerging environmental education movement was given a powerful boost by the United Nations Conference on the Human Environment held in Stockholm in 1972, which recommended that environmental education be recognized and promoted in all countries. This recommendation led to the launching in 1975 by UNESCO and the UN Environment Programme (UNEP) of the International Environmental Education Programme (IEEP), which continued until 1995. The influence of the IEEP - and the national and international activities which it inspired - has been widely felt and is reflected in many of the educational innovations carried out in the last two decades.

84. That work was inspired largely by the guiding principles of environmental education laid down by the Intergovernmental Conference on Environmental Education held in Tbilisi in 1977, which followed a comprehensive preparatory process which included the International Workshop on Environmental Education held in Belgrade in 1975 to draft the concepts and vision which were later taken up by governments in Tbilisi. These encompass a broad spectrum of environmental, social, ethical, economic and cultural dimensions. Indeed, the recommendations of the Rio Conference, held fifteen years later, echo those of Tbilisi, as is evident in the following quotations from the report of the 1977 conference:

- "A basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments

resulting from the interaction of their biological, physical, social, economic and cultural aspects, and acquire the knowledge, values, attitudes and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and the management of the quality of the environment.”

- “A further basic aim of environmental education is clearly to show the economic, political and ecological interdependence of the modern world, in which decisions and actions by the different countries can have international repercussions. Environment should, in this regard, help to develop a sense of responsibility and solidarity among countries and regions ..”
- “Special attention should be paid to understanding the complex relations between socio-economic development and the improvement of the environment.”

85. These principles were successfully translated into educational goals and, with greater difficulty, into schoolroom practice in many countries.

86. The motto of the environmental education movement has been: “think globally, act locally”. Over a period of more than two decades, it developed a highly active pedagogy based on this premise. In the early grades, in particular, the emphasis was upon learning the local environment through field studies and classroom experiments. By starting in the primary grades, before the process of compartmentalization that marks secondary and particularly higher education sets in, students were encouraged to examine environmental issues from different angles and perspectives.

87. The influence of environmental education in promoting interdisciplinary inquiries can be seen at all levels of education. A course on environmental economics, for example, looks to anthropology for insights and source material. It studies the decline of ancient civilizations - e.g., the Sumerian and Mayan and that of the Easter Islands - which exploited their environment without due regard for its sustainability. Equally valuable lessons might be drawn from tribes and groups that faced challenging environmental conditions, but survived against difficult odds by developing an awe, love and respect for nature. In many such cultures, the environment was placed in the sphere of the sacred and used according to a set of well-defined rules that, whatever their origins, served to prevent the over-use and exhaustion of natural resources. Environmental education has also found original ways of looking at and measuring human impact on the environment, such as the “ecological footprint”, which estimates the number of acres of land required to sustain individuals according to their lifestyles and patterns of consumption. Innovative work has also been done in the field of environmental health by relating illness to environmental stress and ways of life.

88. In brief, the record of the environmental education movement is one of resourcefulness, innovation and continuing accomplishments. Lessons learned from environmental education provide valuable insight for developing the broader notion of education for sustainable development.

INTERDISCIPLINARITY

89. A basic premise of education for sustainability is that just as there is a wholeness and interdependence to life in all its forms, so must there be a unity and wholeness to efforts to understand it and ensure its continuation. This calls for both interdisciplinary inquiry and action. It does not, of course, imply an end to work within traditional disciplines. A disciplinary focus is often helpful, even necessary, in allowing the depth of inquiry needed for major breakthroughs and discoveries. But increasingly, important discoveries are being made not within disciplines, but on the borders between them. This is particularly true in fields such as environmental studies which are not easily confined to a single discipline. Despite this realization and a broadening support for interdisciplinary inquiries, the frontiers between academic disciplines remain stoutly defended by professional bodies, career structures and criteria for promotion and advancement. It is no accident that environmental education and, more recently, education for sustainable development, has progressed more rapidly at the secondary and primary levels than within the realm of higher education.

90. Yet, higher education has an indispensable role to play. This is true both in the area of research and in the training of specialists and leaders in all fields. A failure to develop educational programmes related to sustainability in universities and specialized institutes has, therefore, an impact on society as a whole. It is, for example, increasingly important to include appropriate materials on sustainable development in the programmes of study of journalists, engineers, managers, doctors, lawyers, scientists, economists, administrators and numerous other professions. Universities could also render a valuable service by building components of sustainable development into the special programmes for teachers, senior managers, local leaders such as mayors, parliamentarians and others in leadership positions. Universities also play a key role in international cooperation and would do so more effectively if they gave fuller consideration to the needs of scientists and social scientists from developing countries, especially as concerns interdisciplinary inquiries into environment and development issues.

91. Fortunately, the situation appears to be evolving in a favorable direction. Faculties of economics, for example, are adding specialists in environmental economics to their staffs who, by the very nature of their work, are required to develop expertise in scientific and other disciplines. As students arrive at the university from secondary schools with experience in and a taste for interdisciplinary work, universities in many countries are slowly adapting to meet their needs and demands. Major research projects, such as that on climate change, are also developing in specialists the habit of working across disciplines. Ultimately, the growing necessity for interdisciplinary inquiries can be expected to reduce the resistance imposed by entrenched habits and conservative institutional structures.

IV. SHIFTING TO SUSTAINABLE LIFESTYLES: CHANGING CONSUMPTION AND PRODUCTION PATTERNS

92. The effectiveness of awareness raising and education for sustainable development must ultimately be measured by the degree to which they change the attitudes and behaviors of people, both in their individual roles, including those of producers and

consumers, and in carrying out their collective responsibilities and duties as citizens. Both of these roles - the private and the public - are indispensable and mutually reinforcing. A willingness to change one's lifestyle or pattern of consumption is essential but insufficient in itself to bring about societal change. Similarly, one's action as a citizen, no matter how responsible and far-sighted, is inadequate if one's individual behavior and lifestyle are wasteful or destructive. Sustainable development requires both individual enlightenment and responsibility and appropriate policies and action by public authorities and the private sector. If, for example, an individual wishes to use public transportation to reduce urban congestion and pollution, this choice can be effective only if such transport exists and, for most people, will become habitual only if it is both economic and convenient. In short, the move toward sustainable lifestyles is not merely a matter of individual choice; it also requires collective action and responsibility.

INDIVIDUAL CHOICES AND LIFESTYLES

93. The caretaking consumer insists upon purchasing products that are kind to the environment. While this choice is often regarded as a virtuous one and as a burden on the consumer, that need not be the case. It is, for example, possible to develop automobiles that would provide the same comforts as present models, but would go twice as far on a litre of fuel. Production close to home - the site of consumption - is also more energy efficient and, in the case of food, offers greater freshness as well. The resistance to "green choices" often comes not from consumers, but from producers who must change their modes of operation and make substantial investments in new means of production and distribution. Yet, ultimately, the producer must provide what the consumer demands. In this way, alert and informed consumers can exercise an influence on what is produced and sold.

94. Eco-efficiency, i.e. increasing the added value of our activities while reducing our use of resources and the impact on the environment, may have an important role to play in safeguarding the environment. Eco-efficiency calls for better management of existing processes or products to reduce waste, use less energy and facilitate reuse and recycling. New and alternative technologies may also allow for cleaner production. Brazil, for example, is one of several countries that has established training programmes for industrial designers aimed at creating more efficient products. There is also a growing tendency for ecologically responsible firms to assume responsibility for a product throughout-life-cycle: selling the product, maintaining it and recycling it when it is no longer needed. A more radical approach is to look at the underlying need that a consumer meets through consumption, rather than at the means which are currently used to meet that need. For example, the primary use of a car is to provide mobility. Providing suitable, reliable alternatives - such as public transport, car-sharing schemes, home shopping or interactive communications - may enable consumers to meet their needs while having a lower impact on the environment. Eco-efficiency may thus entail a switch in thinking from the supply of products to the supply of services.

95. All of these notions are included in the concept of "sustainable consumption" and "sustainable lifestyles". Sustainable consumption does not necessarily mean consuming less. It means changing unsustainable patterns of consumption by allowing consumers to

enjoy a high quality of life by consuming differently. For example, consumers might be encouraged to buy products which have a longer life, which can be easily repaired or updated. Policies to influence consumption patterns need to work with the market and recognize consumers' needs and desires, thereby helping consumers make informed choices. Here, too, education has an important part to play.

96. Obviously, sustainable consumption has a different meaning when applied to the poor in developing countries and to the socially-excluded in developed countries. For the poor, sustainable development is not only about preserving the environment, but also, even mainly, about providing for human needs such as food, clothing, shelter, health care and security. However, even in the poorest countries, sustainable consumption means avoiding waste. The special session of the United Nations General Assembly on the follow-up to the Earth Summit emphasized the need for developing countries to promote sustainable consumption patterns in the development process.

97. To sum up, the individual through wise consumer choices and responsible behavior can certainly play a useful role in reducing waste and favoring products that do less harm to the environment. These are valuable and practical contributions, but also symbolic ones. The willingness of citizens to sort their trash for recycling, for example, sends a message to elected officials that voters are concerned about the environment.

COLLECTIVE DECISION-MAKING

98. The engaged citizens of a democratic society can exercise a strong influence on behalf of sustainable development through their civic role as well as through their behavior as consumers and producers. Individual lifestyles are inevitably strongly conditioned by public policies. Sorting trash, for example, serves little purpose if the collection service then throws everything into a dump. Individual action must be complemented and supported by public policies at all levels.

99. The main instruments of public policy are laws and regulations, tax and fiscal policies (i.e. the use the government makes of public revenues), and social instruments, especially education (see Part III above). Regulation is the most direct approach: the production and use of certain toxic chemicals or other environmentally harmful products are being controlled and phased out in many countries as less dangerous substitutes are developed. Tax policies, including subsidies, are highly effective in influencing relative prices. Ecological tax reform usually consists in heavily taxing environmentally harmful products and favoring products that are kinder to the environment through reductions in taxes or through subsidies, designed to make such products more competitive. Norway, for example, is moving towards a revenue-neutral tax reform in which taxes on harmful products are used to subsidize "green" products and services. An important part of such reforms is to correct the negative incentives in present tax codes. In the United States, for example, it is estimated that the total subsidy to automobiles - through building and maintenance of roads and other measures - amounts to some \$300 billion dollars annually. In European countries, by contrast, the automobile is a major source of state revenues. This difference is reflected in fuel prices: a litre of fuel in many European countries costs more than a gallon (nearly four times as much) in the United States.

100. Finally, governments and public entities such as schools and hospitals have enormous purchasing power. If procurement policies favor the purchase of environmentally friendly products, producers come under enormous pressure, both directly in the marketplace and indirectly through banks, insurance companies and others who are fearful of the consequences and liabilities they might incur.

101. In sum, in democratic societies public policy responds to the will of the people. It is here that public awareness and understanding of the need for sustainable development best expresses itself through support for laws, regulations and policies favourable to the environment. People express their preferences as they decide how to spend their money, as well as through the ballot. Public action, through voting or otherwise, is contingent on more than "public awareness". What is needed is an understanding of the issues, and of the likely consequences of a given purchasing or electoral decision. For this reason, growing attention has been given in Europe and elsewhere to "ecological audits" and labelling which allows producers of environmentally benign products to advertise this fact to the public. Electoral choices are, of course, effective in terms of sustainability only to the extent that the public is well informed. Public understanding is the foundation for people to fulfill their roles as responsible citizens, consumers and public-spirited individuals.

V. ETHICS, CULTURE AND EQUITY: SUSTAINABILITY AS A MORAL IMPERATIVE

102. Sustainable development calls for comprehensive change in the way society operates. Production and consumption must be restructured in ways that better meet the basic needs of all in an ecologically responsible manner. The present disparities between rich and poor - unimaginable wealth at one extreme and desperate poverty at the other - have to be reduced. Population growth must be moderated and ecologically unsound practices quickly reduced and eventually eliminated. These steps call not only for practical action, but also for fundamental changes in perceptions and values, indeed, for a renewal of culture that will enable societies to confront the major challenge of the 21st century: the quest for sustainable development.

103. Ethical values are the principal factor in social cohesion and, at the same time, the most effective agent of change and transformation. Achieving sustainability will depend ultimately on changes in behavior and lifestyles, changes which will need to be motivated by a shift in values and rooted in the cultural and moral precepts upon which behavior is predicated. Without change of this kind, even the most enlightened legislation, the cleanest technology, the most sophisticated research will not succeed in steering society towards the long-term goal of sustainability. Education in the broadest sense will by necessity play a pivotal role in bringing about the deep change required, in both tangible and intangible ways.

SOME ETHICAL PRINCIPLES OF SUSTAINABILITY

104. Like the notion of sustainability itself, the ethics of sustainability can not be defined or detailed simply. In fact, thinking along these lines is just emerging, as we struggle to combine existing notions to develop a new, integrated ethical concept for the future. For the moment, it is possible to indicate a few new lines of thinking in terms of principles which associate values such as human rights and responsibility, intergenerational equity, solidarity, justice, democracy, freedom of expression, and tolerance.

The “ethic of time”

105. The last few years have been marked by a thorough assessment of the worrisome trends of our times and the negotiation of international, regional and national action plans to redress these trends before they become irreversible. We have at hand, therefore, the diagnosis and in many cases the cure to the ills of the world. What is needed is to take corrective action before it is too late, action which may be costly or unpopular, but which must transpire nevertheless. The need to improve the world is obviously not new. What is new is the risk of irreversibility and all that it implies for the future of society as we know it. The notion of an “ethic of time” is the moral imperative to take action before reaching the point of no return.

106. Within this notion of time, there is also that of “anticipation” and “prevention”. Those in a position to effect change - governments, international organizations, scientific institutions and universities, business and industry - need to shake off inertia and the temptation to find short-term half-way solutions. They need to take up the challenge of doing what all agree needs to be done. While this may seem self-evident, the assessment of progress made five years after the Rio Conference has revealed that in fact little real change has taken place. Despite all efforts and good intentions, we have so far been unsuccessful in coming to terms with the future. The balance sheet of Rio + 5 is harsh proof of the futility of shallow responses to complex and grave problems. The question is: How long can we wait to adopt a new ethic for the future, an ethic which will drive us to rectify our current path and to anticipate our future needs, regardless of how broad or how deep the required changes need to be.

Complexity as an ethical issue

107. Problems related to sustainable development are characterized, *inter alia*, by their complexity. This complexity must be communicated and understood, even though to do so is not easy or necessarily palatable. The simplification of complex issues - so often observed today - is not only fraudulent in that it misrepresents reality, but also irresponsible on the part of those who understand these issues. It is here that the scientific and intellectual communities bear a particular moral responsibility, to ensure that decision-makers as well as the public are fully cognizant of the multiple dimensions of the problems they face. To the extent that knowledge will be the driving force of

change, the link between ethics and science will be key to solving many of the problems of the future.

Continuity: the ethical link between past, present, and future

108. Each action “today” is a step towards creating “tomorrow”: this has always been true. However, never before has the weight of today - with the full cognizance of those “in charge” - been so determinant of humanity’s future. Nothing less than the viability of our planet is at stake. Humanity is thus in a position of power as well as responsibility not only towards the people alive on Earth today, but also towards generations yet unborn who will have no choice but to accept the reality which we will have created. In considering the ethics of sustainability, our moral responsibility towards future generations is of primordial importance. In living up to this responsibility, we must strive to achieve balance and continuity between meeting the needs of today without compromising those of the future, and without losing the memory of what history has already taught us. Recognizing the intergenerational dimension of sustainability is, of course, not new: the report of the Brundtland Commission marked the beginning of thinking of development in terms of the future as well as the present. What is still lacking is a meaningful adjustment of our way of life to reflect this ethical imperative.

109. In November 1997, UNESCO adopted a Declaration on the Responsibilities of Present Generations Towards Future Generations, which aims to ensure through action today a viable future for the coming generations. The Declaration is the fruit of a cooperative effort undertaken since 1994 by Commandant Cousteau’s team and UNESCO, involving researchers and government experts before the final adoption by UNESCO Member States. Its preamble recalls certain fundamental principles: “the necessity for establishing new, equitable and global links of partnership and intra-generational solidarity [...] the avowal that the fate of future generations depends to a great extent on decisions and actions taken today and that present-day problems, including poverty, technological and material underdevelopment, unemployment and exclusion, discrimination and threats to the environment, must be solved in the interests of both present and future generations”.

110. The 12 articles of the Declaration put forward proposals on what can be done to safeguard the needs and interests of future generations in the fields of education, science, culture and communication. Concerning the environment, for example, Article 4 states that “the present generations have the responsibility to bequeath to future generations an Earth which will not one day be irreversibly damaged by human activity. Each generation inheriting the Earth temporarily shall take care to use natural resources reasonably and ensure that life is not prejudiced by harmful modifications of the ecosystems and that scientific and technological progress in all fields does not harm life on Earth.” The idea is reinforced in Article 5 which stipulates that the present generations “should ensure that future generations are not exposed to pollution which may endanger their health or their existence itself.” Emphasizing the importance of culture, the Declaration considers it the responsibility of the present generation to “identify, protect and safeguard the tangible and intangible cultural heritage and to transmit this common heritage to future generations” (Article 7). This is also the thrust of

the articles concerning development and biodiversity. There is, on the one hand, the questions of ensuring “the conditions of equitable, sustainable and universal socio-economic development” (Article 10) and, on the other, of protecting the “human genome, in full respect of the dignity of the human person” (Article 6).

CULTURE AND SUSTAINABILITY

111. While culture is elusive to definition, it may be taken to refer to all those mentally generated forms of organization created, preserved and transmitted within a social group or, in a wider context, the human species. Culture includes our whole system of beliefs, values, attitudes, customs, institutions and social relations. It shapes the way we perceive the world (including ourselves) and how we interact with it. To the extent that the global crisis facing humanity is a reflection of our collective values, behavior and lifestyles, it is, above all, a cultural crisis.

112. Culture is, therefore, an inextricable part of the complex notion of sustainability. It can be seen as an arbiter in the difficult trade-offs between conflicting ends with regard to development goals. As pointed out in the report of the World Commission on Culture and Development set up jointly by UNESCO and the United Nations, culture is not only the “servant of ends but (...) the social basis of the ends themselves”, a factor of development but also the “fountain of our progress and creativity”.

113. For example, changing wasteful patterns of consumption, particularly in the industrialized countries, is an area where culture will clearly have an instrumental role to play. Changes in lifestyle will need to be accompanied by a new ethical awareness whereby the inhabitants of rich countries discover within their cultures the source of a new and active solidarity which will make it possible to eradicate the widespread poverty which now besets 80% of the world’s population as well as the environmental degradation and other problems which are linked to it.

114. For all the people of the world, culture is a very practical, concrete determinant of sustainable development. The kind of change required by sustainability implicates each community, each household, each individual. Successful solutions to problems at this level of society will need to be rooted in the cultural specificity of the town or region if the people are to be supportive of and involved in such change.

115. And yet the cultural diversity of humankind is today in jeopardy. In this respect, a parallel can be drawn between biological diversity and cultural diversity, which may be seen as aspects of the same phenomenon. Just as the multitude of diverse species and life forms that constitute the Earth’s biological diversity have evolved to adapt to different geographical and climatic conditions, so the adaptability of the human species is expressed in humanity’s cultural diversity. Just as nature produces a variety of species adapted to their environment, so humankind develops varied cultures in response to local conditions. Cultural diversity may thus be seen as a form of adaptive diversity and, as such, a prior condition to sustainability. The present trend towards globalization is threatening the richness of human cultures, and has already destroyed many traditional

cultures. The argument for halting the loss of species is also applicable to the loss of cultures, and the consequent diminishing of humanity's collective repertoire for survival.

TOWARDS A COMMON ETHIC

116. Today people are more aware than ever of global realities. We are beginning to understand the impact of our individual and collective actions on ourselves and on the biosphere as a whole. The concept of sustainability is in itself a reflection of this new awareness. Perhaps we are beginning to move towards a new global ethic which transcends all other systems of allegiance and belief, which is rooted in a consciousness of the interrelatedness and sanctity of life. Would such a common ethic have the power to motivate us to modify our current dangerous course? There is obviously no ready answer to this question, except to say that without a moral and ethical foundation, sustainability is unlikely to become a reality.

EDUCATION, ETHICS, AND CHANGE

117. In the early 18th century, the bases of the industrial revolution that was then beginning did not exist: neither mentally, nor socially nor technically. But the vision of a society organized in a new way and operating by new rules took root. At the close of the 20th century, it is clear that societies are beginning to consider the concept of sustainable development and, in some cases, to confront the profound changes that it implies. Fundamental social changes, such as those required to move towards sustainability, come about either because people sense an ethical imperative to change or because leaders have the political will to lead in that direction and sense that the people will follow them. Human societies are skillful at estimating risks, dangers and limitations. They are much less experienced in calculating their own potentialities: their capacities to invent, innovate, discover, reorganize, create, correct and improve. Societies need to be convinced of the need for sustainable development, in order to show their capacity to devise solutions to the problems confronting them.

118. It is in this context that education and public awareness are seen as essential to bringing about conditions conducive to sustainable development. Ethical values, such as equity, are shaped through education, in the broadest sense of the term. Education is also essential in enabling people to use their ethical values to make informed and ethical choices. Over time, education also powerfully affects cultures and societies, increasing their concern over unsustainable practices and their capacities to confront and master change. Indeed, the potential of education is enormous. Not only can it inform people, it can change them. It is not only a means for personal enlightenment, but also for cultural renewal. Education not only provides the scientific and technical skills required, it also provides the motivation, justification, and social support for pursuing and applying them. Education increases the capacities of people to transform their visions of society into operational realities. It is for this reason that education is the primary agent of transformation towards sustainable development. It is also for this reason that society must be deeply concerned that much of the education presently on offer falls far short of what is required. Improving the quality and coverage of education and reorienting its goals to

recognize the importance of sustainable development must be among society's highest priorities.

VI. MOBILIZING FOR ACTION

119. While sustainability is a long-term goal for human society and a process which will necessarily need to take place over time, there is a sense of urgency to make progress quickly before "time runs out". We are therefore faced with a tremendous challenge, a challenge of unprecedented scope, scale and complexity. We are pressed to act even as we are still working out new concepts and new methodologies. We are pushed to change structures and mindsets, yet there is no obvious path, no model which shows the way. Experimentation and innovation are the watchwords, as we search - often simply through trial and error - for adequate solutions. And we must do all this in a climate of sweeping economic, social and political change, while being exhorted to "do more with less".

AN INTERNATIONAL FRAMEWORK FOR ACTION

120. We do have an internationally negotiated framework for action which has been hammered out during the series of United Nations conferences dealing with different aspects of sustainable development, beginning in 1992 with Rio (environment and development), and followed in 1994 by Cairo (population), in 1995 by Copenhagen (social development) and Beijing (women), and in 1996 by Istanbul (human settlements). Each of these conferences, as well as the three conventions on biological diversity, climate change, and desertification, contain explicit recommendations or whole chapters devoted to education and public awareness. The international consensus which these agreements represent is a solid and comprehensive basis for moving forward.

121. At the heart of this new international consensus is a new vision of education, public awareness and training as the essential underpinning for sustainable development, a linchpin to support advances in other spheres, such as science, technology, legislation, and production. Within the action plans, education is no longer seen as an end in itself, but as a means to:

- bring about the changes in values, behavior and lifestyle that are needed to achieve sustainable development, and ultimately democracy, human security and peace;
- disseminate knowledge, know-how and skills that are needed to bring about sustainable production and consumption patterns and to improve the management of natural resources, agriculture, energy and industrial production;
- ensure an informed populace that is prepared to support changes towards sustainability emerging from other sectors.

122. These action plans are to be implemented not only for international institutions such as the United Nations system, but also and most importantly by national and local entities. A range of "major groups" - including women, youth, farmers, parliamentarians, scientists, business and industry and others - are called upon to participate, as well as governments and non-governmental organizations at all levels.

CHAPTER 36 OF AGENDA 21

123. Chapter 36 of Agenda 21, entitled "Promoting education, public awareness and training", provides an umbrella for all action related to education for sustainable development, including that foreseen by the other UN conferences. The chapter is sweeping and comprehensive in scope. In addressing three programme areas (A. Reorienting education towards sustainable development; B. Increasing public awareness; C. Promoting training), chapter 36 encompasses all streams of education, both formal and non-formal, including basic education and environmental education.

124. After the Rio Conference, governments decided to establish within the United Nations the intergovernmental Commission on Sustainable Development (CSD) which meets each year to monitor the implementation of Agenda 21. Chapter 36 was reviewed in 1996 at the fourth session of the CSD, which decided at that time to adopt a special work programme which outlines priorities for action within the vast scope of chapter 36. Work programmes are initiated by the Commission for themes considered of particular importance and for which it wants some concrete action to be taken on its behalf. In addition to education, the CSD has work programmes on changing consumption and production patterns, technology transfer, and indicators for sustainable development.

125. The work programme of the CSD on chapter 36 focuses on the priorities outlined in Box 1, and identifies the key actors for each priority. This work programme is now being developed in more detail by UNESCO as Task Manager, for review by the sixth session of the CSD in April 1998. As Task Manager, UNESCO acts as a facilitator and mobilizer within the UN system and with other key institutional partners, governments, major groups and the private sector.

126. At the nineteenth special session of the United Nations General Assembly held in June 1997 to review implementation of Agenda 21 five years after Rio, the work of chapter 36 was given further impetus by the reaffirmation of governments of the importance of education in achieving sustainability, as reflected in Box 2.

ACTION AT THE NATIONAL LEVEL

127. It is at this level that overall strategies for sustainable development must be given clarity and impetus and the need to integrate education into them in creative and effective ways recognized and acted upon. This involves the national government - which has the leadership role - major NGOs and associations, citizens groups, including corporate citizens, educational and other specialized institutions. Also involved are the agencies and organizations of the United Nations system which are endeavoring to work closely together with national authorities in implementing the recommendations of the various international conferences that have pointed the way towards sustainable development. The media should also be engaged to explain the purposes and goals of programmes and in making government plans and action known to the public.

128. What should be done at the national level?

129. Governments should play a leading role in explaining the vision and benefits of sustainable development to the public. It should do so through all means available, public and private. As already noted, the media have an important role to play, including both the most modern and the most traditional media. The national school curriculum, at all levels, must incorporate the messages of sustainable development. These messages must also be emphasized in pre-service and in-service programmes of teacher training. Specialized institutions of all sorts should be actively involved. The relationship between environmental factors and health problems, for example, should be explained by doctors, nurses and hospitals.

130. Government leaders have to translate the concept of sustainable development into clearly definable steps and goals. Such goals should be set for every sector. There should, for example, be a clear timetable for reorienting the education system with the necessary budget and resources to achieve the goal. In many countries, national strategies or plans for sustainable development are instrumental in mobilizing and focusing efforts around national priorities. Such plans also exist within some regions, such as the Action Plan for the Sustainable Development of the Americas, adopted in Santa Cruz de la Sierra, Bolivia, in 1996.

131. It is essential that national leaders demonstrate that there is political will to give priority to sustainable development and that they see public awareness raising and education and training as essential means for achieving national objectives.

132. The civil society at all levels, especially the national, should express its support for vigorous action aimed at advancing towards sustainable development. Organizations with specialized interests and competencies should not only support government action, but also monitor and assess them within their areas of competence and keep the public informed of both progress and problems. Teachers associations, for example, should carefully assess the progress being achieved in reorienting the education system towards sustainability and should keep both their members and the public-at-large informed of the situation.

133. Increasingly, the United Nations system recognizes that the national level is where actions in support of sustainable development are most effective. The United Nations system also recognizes that to be effective in promoting such action it must work as a team, not as a collection of individual organizations and agencies, in close cooperation with national partners.

ACTION AT THE LOCAL LEVEL

134. The axiom "think globally, act locally" is as true today as ever. The role of the local community is of particular importance because the movement towards sustainable development can not succeed on a "top down" basis alone. What is needed is not only passive consent, but also active involvement on the part of the people. Actors at this level

include the community and its leaders, local government, NGOs and associations working in the community, the private sector, local departments and services of national government, and of course people of all ages including youth. In a growing number of communities, local Agenda 21 groups have been established and are taking the lead in mobilizing support for local initiatives. Local needs will evidently determine local priorities and actions. It is important, however, for the local community, in consultation with national leaders and national government, to understand its place in the “big picture” of national and global action for sustainable development.

135. What should be done at the local level?

136. The meaning and vision of sustainable development should be disseminated, discussed and debated in order to promote understanding and win community support. These discussions should take place in all community settings and institutions, including in schools.

137. The need for sustainable development at the local level must be understood. Practices that are not sustainable should be identified. Possibilities for correcting them can then be discussed and explored. It is critically important that the entire community, especially women, be involved in this discussion. Women, especially in rural communities, usually play a key role in the economic as well as in the social and cultural aspects of life. The local community and the household are important entry points for messages on sustainable development, especially for adults and out-of-school children. The schools, too, at all levels, should be actively involved in both discussions about and action to achieve sustainable development.

138. By words and by deeds, the local community can demonstrate its support for action at the national and global level to support sustainability. A willingness to address local problems sends the message that the people are ready and expect the government to act.

BOX 1

WORK PROGRAMME OF THE CSD: EDUCATION, PUBLIC AWARENESS AND TRAINING*	
<u>Priorities Agreed upon by the CSD</u>	<u>Key Actors Cited by the CSD</u>
A. Develop a broad international alliance, taking into account past experience and promoting networks	UNESCO as task manager, in partnership with UNEP, IUCN and other key institutions
B. Integrate implementation of recommendations concerning education, public awareness and training in the action plans of the major UN conferences and conventions	UN system, Governments, major groups
C. Advise on how education and training can be integrated into national educational policies	UNESCO, in cooperation with other governmental and non governmental organizations
D. Refine the concept and key messages of education for sustainable development	UNESCO
E. Advance education and training at national level	Governments, with assistance from the UN system and others
F. Provide financial and technical support	Developed countries, international organizations, private sector
G. Develop new partnership arrangements among different sectors of society. Exploit the new communications technologies. Take into account cultural diversity	Educators, scientists, Governments, NGOs, business and industry, youth, the media, other major groups
H. Work in partnership with youth	Governments and all relevant stakeholders
I. Analyse current investments in education	Bretton Woods institutions
J. Take the preliminary results of the work programme on chapter 36 into account in the 1997 review	Secretary-General of the United Nations
Make relevant linkages with the CSD programme of work on changing production and consumption patterns	UN system, Governments, NGOs

**Summary of the decision of the 4th session of the UN Commission on Sustainable Development (New York, May 1996) concerning chapter 36 of Agenda 21, prepared by UNESCO as Task Manager.*

BOX 2

EARTH SUMMIT + 5

Overall Review and Appraisal of the Implementation of Agenda 21*

CHAPTER 36: PROMOTING EDUCATION, PUBLIC AWARENESS AND TRAINING

- Education increases human welfare, and is a decisive factor in enabling people to become productive and responsible members of society.
- A fundamental prerequisite for sustainable development is an adequately financed and effective educational system at all levels, particularly the primary and secondary levels, that is accessible to all and that augments both human capacity and well-being.
- The core themes of education for sustainability include lifelong learning, interdisciplinary education, partnerships, multicultural education and empowerment.
- Priority should be given to ensuring women's and girls' full and equal access to all levels of education and training. Special attention should also be paid to the training of teachers, youth leaders and other educators. Education should also be seen as a means of empowering youth and vulnerable and marginalized groups, including those in rural areas, through intergenerational partnerships and peer education.
- Even in countries with strong education systems, there is a need to reorient education, awareness and training so as to promote widespread public understanding, critical analysis and support for sustainable development.
- Education for a sustainable future should engage a wide spectrum of institutions and sectors, including but not limited to business/industry, international organizations, youth, professional organizations, non-governmental organizations, higher education, government, educators and foundations, to address the concepts and issues of sustainable development, as embodied throughout Agenda 21.
- [Education for a sustainable future] should also include the preparation of sustainable development education plans and programmes, as emphasized in the Commission's work programme on the subject adopted in 1996.
- The concept of education for a sustainable future will be further developed by the United Nations Educational, Scientific and Cultural Organization, in cooperation with others.
- It is necessary to support and strengthen universities and other academic centres in promoting cooperation among them, particularly cooperation between those of developing countries and those of developed countries.

**Extract from the report of the 19th Special Session of the General Assembly of the United Nations (June 1997) (A/S-19/29, para 105-106)*