

The Study of the Environment

by

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With the dawn of the space age for the first time man was able to look at his home from outside the earth. An Appolo astronaut, William Anders, had just returned from a flight around the moon and was called upon to address a meeting such as this. Here are his words: "The earth appeared as a small blue-green sphere like a beautiful ornament, very delicate and limited, the only colour in the dark universe, the only friendly place we could see. The ancestral home of mankind did not appear vast, unlimited, and undestructible as we often see it when groping here on its surface. It seemed much more like a delicate and fragile ornament that you must learn to preserve and protect with appropriate care. Looking back I saw no national boundaries, no dividing up of the earth into separate states, each with a different colour as you see on a globe in a schoolroom, a globe divided on the surface by man but obviously not by nature. When viewed from this perspective, I saw instead a small but inviting oasis in the vast blackness of space. While viewing the home planet from nearly a quarter of a million miles away, the words of the American poet, Macleish, came to mind. 'The earth, as it truly is, is small and blue and beautiful in the eternal silence where it floats.'"

The space programme indeed has given us a new perspective of our home planet earth. Although the major discoveries have shown us the possibility of billions of other worlds, in our own solar system the earth appears to be the only home of life. If we take a close look at the planets, as we move from Mercury to Venus we see a barren landscape completely unfit for any kind of life. Then we come to earth, the blue sphere of the astronauts, which is the only abode of life in this solar system. As we move to Mars, even though there was the hope and possibility of life, we found that the conditions were such that the evolutionary history of the planet itself had made it unfit for any further human habitation. Jupiter, Saturn, and Uranus which we have been able to study at close quarters by our spacecraft give

us a view inhospitable by terrestrial standards. The earth, then is the only home of life in this solar system. It is for us to protect it and its environment.

Two decades ago, an ecologist was considered to be somebody far out who did not understand the process of development. But today it is more than ever a realization that development and the preservation of the environment must go hand in hand. As a matter of fact, while we are assembling here today to celebrate World Environment Day, we have before us the release of the UN Study which offers an agenda for the future. The UN World Commission on Environment and Development which was composed of a blue ribbon group headed by the Norwegian Prime Minister Gro Brundtland, William Ruckelshaus, who was twice Administrator of the Environmental Protection Agency of the United States, Morris Strong, Secretary General of the United Nations Conference on the Human Environment, and Vladimir Sakolov, Head of the Department of Vertebrate Zoology, Moscow University, has just released its report entitled "Our Common Future." In clear but blunt terms the Commission describes the process going on in the world as a squandering of our biological capital. In the past decade-and-a-half, according to Mrs. Gro Brundtland, the Chairman of the Commission, most developing countries, especially the newly industrializing ones, have experienced a massive environmental deterioration associated with sudden industrialization and explosive urbanization. She warned that this ecological decline will become a significant causal factor in economic, social, and political unrest. They are manifest in the growing migrations of ecological refugees, the increasing frequency and intensity of natural disasters, and social collapse of exploding settlements.

The recommendations of the Committee are crystal clear. First, to re-examine the critical issues of environment and development and formulate innovative, concrete and realistic action proposals to deal with them. Secondly, to assess and propose new forms of international cooperation on environment and development that can break out of existing patterns and influence policies and events in the direction of needed changes. Thirdly, to raise the level of understanding and commitment to action on the part of individuals, voluntary organisations, businesses, institutes and governments. In our country, the Central Environ-

mental Authority will have the responsibility of implementing these recommendations.

The entire globe has to be viewed as a whole. The recent discussion on the Nuclear Winter made it very clear that a catastrophe occurring in one location would affect the entire earth. The scientists who met together to discuss the implications of a single nuclear explosion were in unanimous agreement that no part of the planet would remain unaffected. The dust cloud generated by a nuclear explosion of a hundred megaton H-bomb would prevent solar radiation from reaching the earth, interfere with the process of photosynthesis and, finally, result in the elimination of all life upon its surface.

Similarly, the recent studies of the depleting ozone layer which acts like an umbrella to prevent ultraviolet radiation from reaching the surface of the earth, points to the fact that any destruction of this protective natural sheath in the stratosphere may result in changes to the climate of the earth. The increasing concentration of fluorocarbons in the upper atmosphere will result in the removal of the ozone in a step-wise manner. The problem of ozone depletion took a dramatic new turn when data from the satellite Nimbus 7, specially equipped to monitor the total ozone levels, showed that every year there was a little less ozone in the springtime over Antarctic than in the previous year. The "ozone hole" which was the name given to the area of thinning-out of ozone concentration has been steadily increasing over the years. In mid-October it was found to decrease fifty-percent from the August value. While this "hole" still remains a mystery, we must be aware of the fact that if the ozone layer get depleted the beneficial shield will be weakened and will result in faster mutations and enhanced genetic defects. Cases of skin cancer will increase and all forms of life may be endangered. The oxygen cycle will be disturbed, crops will be damaged, climate changes may lead to altered growing seasons, location of the desert areas, and the level of the oceans. No wonder the environmental scientist is concerned about the "ozone hole" over the Antarctic.

At the global level, another matter of great concern to the scientific community is the build-up of carbon dioxide. It is expected that over the next several decades the atmospheric build-up of carbon

dioxide will raise the earth's temperature to levels unprecedented in human history. The cost of adapting to higher temperatures, the shift in rainfall patterns, and the rise in ocean levels will severely strain the economies of both industrial and developing countries. Because of our dependence on fossil fuel a change in the world's climate is inevitable. The pace at which this will unfold will depend on the use of coal, oil, and natural gas. Although a decade ago it seemed unreasonable to limit the annual growth of CO₂ emissions to one percent, today it seems entirely feasible. At a one percent annual level of increase, the CO₂ doubling could be delayed for a century.

No nation alone can avert the costly consequences of altering the earth's climate. CO₂ emissions anywhere contribute to climate changes everywhere. A decision to place a massive tax on fossil fuel combustion would have serious political and economic repercussions. Few nations would agree to such a measure without guarantees that others would do the same. Although fossil fuels have figured prominently in our quest for economic growth and higher standards of living, their detrimental effect threaten to undermine a substantial portion of the gains obtained by their use.

Regional problems result from geophysical linkages among groups of countries. Typical examples are the effects of river development upstream and downstream, the spread of desertification across national borders, and trans-national pollution. The Chernobyl disaster, for example, resulted in the increase of radioactivity in the milk supply right across the European continent. Traces of radioactivity were airborne across the Atlantic to the North American landmass. An accident of that nature in a country can easily affect the quality of life of a distant neighbour. Acid rain resulting from the sulphur dioxide emitted from the smokestacks of industrial towns along the Canadian-American border has resulted in the denudation of the forests in that area.

At the local level, the problems are contained within national boundaries and are more easily controlled. These include the creation of an esthetic blight, the eutrophication of lakes by fertilizer or the poisoning of lagoons as in the case of the Minimata disease resulting from mercury running into some of the lakes around a Japanese industrial

city. At first sight, these appear to be the easiest to overcome by national control. Legislation at the national, regional, or city level can often provide the answer to such problems.