World Conservation Problems

Population

The world population is now over 6 billion and is increasing by 90 million a year. Human numbers are expected to grow to between 8 and 11 billion before levelling off later in the 21st century.

Population growth has levelled off in the highly developed countries over the past few decades; but these industrialised states are now supporting the maximum numbers that can be sustained in the short term, and the citizens consume around 30 times as much energy and resources as those of the Third World. For example, the 120 million Japanese have a greater damaging impact on world resources than the whole of the population of India and China put together.

The Space Available to Us

71% of the Earth's surface is covered by water

29% is therefore dry land - of which:

20% of the land surface is too dry for agriculture

20% of the land surface is too cold for agriculture

20% of the land surface is too mountainous for agriculture

20% of the land surface is forested or marshy

20% of the Earth's land surface is left available for growing food and all the other crops that we need for our ever-increasing population.

Widespread changes of the environment began to take place during the early development of the social organisation and civilisation of humans. In general, however, their influence had no greater effect than that of earthquakes or volcanic eruptions. As human numbers multiplied, particularly in the temperate regions of the

world, and permanent settlements were formed, the rate of environmental change gradually increased. Forests were cleared for fuel and farming purposes, marshes drained and large predatory animals, which were a threat to domestic stock, were destroyed.

Unfortunately, nature was regarded as an enemy to be exploited and overcome whenever possible. It was imagined that natural resources were inexhaustible. In the short period of time since the Industrial Revolution, human power to change the environment has developed at an alarming rate, but has been used mainly to destroy and damage rather than to protect.

Industry, economics and science still dominate the use made of our environment. Poor land management, the dramatic extension of deserts and the removal of large areas of forest - especially rain forest - are leading not only to the extinction of many species of plants and animals but also to changes in climate.

The limitation on space posed by world population, demands that if we are to take account of the heritage to be enjoyed by future generations, we must come to terms with the reality of our finite resources. At least we are now aware of the enormous danger our Earth faces. We must try to anticipate the capacity of our environment to meet the needs of expanding populations. This is what conservation is all about.

Most of us want to conserve the countryside and the plants and animals that live there, but we also demand food, fuel and water, so we need efficient farms, power stations and reservoirs. We also need the factories and offices which pay for them, and a multitude of other things which contribute towards our standard of living. We want farmers to stop using pesticides and preserve hedgerows but we still want cheap food. We want new roads to re-route traffic around towns and villages - and we complain about motorways intruding into the countryside!

While development is obviously desirable, especially in those countries whose people are living in unacceptable poverty, improvement in their conditions can only be sustained if we adopt ecologically sound principles.

Priorities

On March 5th 1980, the World Conservation Strategy (WCS) was launched simultaneously in more than 30 countries. It was prepared by the world's leading conservation agencies and identifies three main priorities:

a) maintaining Earth's ability to support life.

b) preserving genetic diversity by preventing the extinction of species.

c) ensuring sustainable utilisation of species and ecosystems.

These priorities were once again discussed in 1992, when just over 170 countries gathered together in Rio de Janeiro for the "Earth Summit" meeting. 150 of these countries agreed to promote "sustainable development" and they set out some guidelines, an action plan called
Agenda 21
; this outlines ways in which governments and all members of society can take action to help make our lifestyles more sustainable as we move into the 21 century.

Maintaining the Earth's Ability to Support Life

When dealing with the first of these priorities we can consider 3 main areas; agricultural systems, forests and coastal and freshwater systems.

Agricultural Systems

We have already seen just how little living space we have in which crops will grow satisfactorily. Only 11% of the land surface (excluding the Antarctic) offers no serious limitation. Sadly, governments take little note of this when planning roads and cities. In developed countries alone, 1150 sq. miles of prime agricultural land each year disappears under urban sprawl. In Britain, an area the size of Greater London has disappeared in the last ten years. Soil is crucial to life since most of our bulk foods depend on it. Soil erosion is a natural and continuous process, but provided we maintain a cover of trees or other plants it is regenerated at the same rate as it is lost. If, however, we remove the protective cover, soil loss is accelerated. Can it be replaced? Under ideal conditions of vegetative cover it would take between 3,000 and 12,000 years to produce a soil depth equivalent to this page (30cm) - too slow for present generations!

Simple soil loss is not the only problem. In India an equivalent amount of nutrients is lost through flooding as is applied as fertilisers. River basins and the productive mangrove swamps are being silted up. Reservoirs built to store water are instead storing silt - with far-reaching effects.

Forests are much more than a resource to be used for export revenues (short term gains) and firewood, however desperate the need. They are our planet's air conditioners absorbing carbon dioxide and liberating oxygen. They influence to a large extent local and regional climates, generally by making them less extreme. They help ensure a continuous supply of clean water.

Forests growing in the immediate vicinity of rivers are particularly important because they provide soil cover

and protect areas downstream from the damaging effects of water fluctuations. Flood damage in India costs £70-375 million per year. India's problems stem almost entirely from the removal of the watershed forests in t he north. The result is the same whether commercial logging, over-grazing or the collection of firewood is the cause.

Forests

Rain forests are being destroyed at the rate of at least 60,000 square kilometres per year! Half the Earth's woodland cover has disappeared since 1950!

Africa alone demolishes almost 5 million acres annually for firewood. In the Ivory Coast the rain forest has diminished from 30 million to 10 million acres in just 25 years - 90% of the timber going to Europe. Without this forest cover it has been found that rain water runs off at an accelerated rate or evaporates.

This is affecting not only the amount of water available for agriculture in the Ivory Coast, but even more so in the already drought-stricken region of Mali and Upper Volta. As the forest disappears in the south, the savanna encroaches from the north. Sadly, the story is being repeated in many countries. Unfortunately, while the genetic base of the world's crops narrows, the means by which this can be corrected i.e. the diversity of wild crop varieties and relatives, are being destroyed.

Human beings have become a major evolutionary force - and while lacking the knowledge to control the biosphere we certainly have the power to change it radically and even destroy it. We have, therefore, a moral obligation to our fellow creatures and future generations to manage it in a way that will preserve as much as possible of its interest and genetic diversity. (For more information on rainforests, see our fact sheets on Rainforests, Rainforest Tribes and Animals of the Rainforest).

Coastal And Freshwater Systems

An estimated two thirds of the world's fisheries depend ultimately on shallow seas - especially estuaries and mangrove swamps. These provide the essential nurseries for fish, crustaceans and molluscs as well as being the homes of many birds and other animals. Coral reefs too are of great local importance. In fact, if it were not for the coral building organisms more than 400 islands would not exist! In Sri Lanka repeated removal of corals for the production of lime has led to the collapse of a whole fishing industry. Coastal areas are very susceptible to pollution by industrial works and sewage.

Preservation of Genetic Diversity

In Europe and the Mediterranean region we have some 145 indigenous breeds of cattle, no fewer than 115 of

which are threatened with extinction, yet, as with plants, many traditional strains are of great value for breeding purposes. In Wensleydale, the now rare Wensleydale sheep has been used for crossing to produce a heat tolerant breed of sheep able to produce good quality wool in subtropical areas. The Cornish hen, once only maintained as a curiosity is now the basis of our broiler industry.

Researchers today are looking more and more towards animals to try and solve human problems. For example, in their search for a more effective crash helmet, they have turned to the woodpecker - how is it that it can hit a tree repeatedly with its beak at 1300mph without damaging itself, but at relatively low speeds people in motor cycle accidents often suffer fatal head injuries?

One of the world's most distressing diseases is leprosy. To date, research has been difficult because we have been unable to culture the disease, but it has now been discovered that the 9-banded armadillo from South America may hold the key because it too can contract the disease.

Manatees and Dugongs are on the list of endangered species - they have poorly clotting blood which may prove useful in the research into haemophilia. The black bear and other animals which hibernate possess hormonal mechanisms which enable them to sleep for five months during the winter. This type of metabolism may well supply information on the development of low protein, low fluid diets that may be of great importance to humans suffering from kidney failure. Many pharmaceutical industries rely for their raw materials on wild material. Pharmaceutical industries have recently been established in Asia, Africa and Latin America. More than 40 of the 90 species of plant used in modern medicine in these countries are available only from the wild and a further 20, though cultivated, are also taken from the wild. To preserve these pharmaceutical industries the plants on which they depend also need to be conserved.

We have looked at the way in which the researcher is turning more and more to the natural world to solve our problems. Hunger too is a problem that affects almost two thirds of the world's population. Yet those of us in the West apparently living in lands of plenty should not be too complacent. Of the many thousands of plants available only about 30 form most of the world's staple diets and within those 30 species the genetic base is often very narrow. 75% of the crop grown on the Canadian Prairies is devoted to a single variety of wheat. The U.S. soya bean industry is derived from a mere 6 plants.

The loss of any species, however insignificant, is a loss to science and mankind as we cannot be sure whether or not that species may prove to be valuable in the future. Therefore, there are good economic reasons for conserving populations of species, ie.

biodiversity

Extinction Is For Ever!

The Earth has some 5 - 10 million species. It is estimated that we are losing ONE SPECIES PER DAY at the moment . What multitude of secrets will these creatures and plants take with them? By safeguarding the

welfare of these endangered species we must also be safeguarding our own!

Sustaining the Utilisation of Species and Ecosystems

Over the past 30 years or so, more and more nations have come to recognise the importance of conservation in social affairs and biological research. Every country has developed ideas of conservation to suit the cultural and scientific needs of its own people.

In the 18th and 19th Centuries in Europe, hunting as a sport became very popular and the importance of game species came into being. The term 'wildlife' was closely associated with preservation of game animals. For example, the work of the American Fish and Wildlife Service was primarily concerned with those animals of interest to the hunter and sportsman, although this has been changing. Nowadays, wildlife is internationally defined as including all species of animals and plants found in nature.

There are several ways in which countries attempt to maintain their habitats and indigenous wildlife. These include:

1. National Parks, Game Reserves and Nature Reserves

Basically, all parks and reserves are wild areas which are designated as protected habitat. However, each one differs in the description of its purpose and function.

The national parks established before World War II generally followed the American ideal of a wild, natural landscape of great scenic beauty e.g. the Yellowstone National Park, founded 1872. The national parks of Africa are amongst the finest wildlife regions left in the world. They were created as sanctuaries for the huge variety of large game animals which live there e.g. Serengeti National Park (5400 square miles)

The name 'Nature Reserve' is widely misused. It ranges from the strict sanctuary to those whose function is more for public recreation. Probably the best publicised are those created to protect rare or interesting animals in their habitats. A nature reserve is usually a smaller unit of land and therefore has a more specialised role than the National Park. Its purpose may be to preserve a particular type of vegetation e.g. bog or marsh, the breeding haunts of interesting birds or the localities of rare plants. A more directly scientific role of nature reserves is the preservation of variety. To allow extinction is bad management. The protection of wildlife is a sensible investment for the future.

An African game reserve differs from a national park in that natives and their domestic stock are allowed to use the area, whereas they are normally excluded from a national park. This has brought problems of

overgrazing in some parts, but naturally the semi-nomadic indigenous tribes such as the Masai resent being kept away from land they regard as their heritage. Regulating the use of grazing lands so that there is no competition between domestic and wild stock is a formidable problem.

Another problem is regulating the intrusion by tourists; animals and plants are easily disturbed and erosion may occur, brought about by the trampling of feet. Again, a balance must be maintained, since tourists bring much needed cash into the country concerned.

The African parks and reserves have been suffering increasingly from an overwhelming threat from poaching, particularly of their rhino and elephant populations. An effective patrol force would help considerably, as would stricter legislation on the export of wildlife products and a universal lack of public demand. However, in many cases, there is not enough money to fund patrol forces, and there are still people who will buy wildlife products.

2. Wildlife and Hunting

If there was no other form of conservation apart from the designation of parks and reserves then many of our familiar animals and plants would rapidly disappear. Hunting and forest reserves make a significant contribution to the total conservation effort in many countries. The object of these reserves often seems to be contrary to the interests of wildlife, but in fact they are a safe haven for many wild animals. The huntsman attempts to eliminate certain predatory animals which compete with him and this appears to conflict with conservation principles. However, a lot of wildlife benefits from the safe haven offered by land set aside for hunting, and game animals often live better (if abruptly ended) lives, being regularly fed and having little to fear from predators.

Whatever one's opinion may be of 'blood sports', it cannot be denied that if it were not for the interest in fox-hunting in Britain, the red fox may well have been persecuted into extinction by now, going the same way as the wolf did in the 18th Century.

3. Managing the Ecosystem

Over the centuries, humans have waged war against those birds, mammals and insects which have threatened their crops and domestic stock. It wasn't until late in agricultural history that it was realised that proper studies of the biology of pest species were necessary before they could be controlled effectively. The intricacies of the delicate Food Web are not always taken into account. In many cases the problems which sometimes follow the destruction of predators have been complicated and unpredictable. In areas where no natural predators are present, selective culling may have to be introduced in order to maintain a balance with the food supply and a healthy stock.

The management of habitat land reserves which have been modified by man's activities requires three types

of information:-

i) a knowledge of past land use.

ii) a knowledge of the ecological relationship between all the living organisms present.

iii) a knowledge of how to use all the information against the reserve's historical background in order to devise practical methods of maintaining the scientific interests. This is an interesting aspect of conservation because it accepts humans as other animals in the environment, integrating their activities with other species.

However, although people have managed to live harmoniously with their environment in the past, circumstances today have changed. Technology and science have given humans such power to exploit natural resources that they have, unfortunately, tried to rule nature rather than work with it and consequently created waste and dereliction all around them.

The Future

Can the world's problems be overcome? Is there a future for humans on Earth? Will they be able to feed the expected 8 billion people by the beginning of the 21st Century? Is the human race heading for self destruction? These are difficult questions to answer with any certainty. We can only speculate. We do not know the real limits of population expansion which the world's resources can support. We are still assessing the role of all living organisms in our technological age. There is still much to be learned about nature and its potential for serving our needs in a sustainable way.