

The Environment A Gift of God





THE ENVIRONMENT A GIFT OF GOD

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**INSTITUTE OF ISLAMIC
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(IKIM)**

The Environment - A Gift of God

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CONTENT

FOREWARD

Director General,
Department of Environment (ii)

FOREWARD

Director General,
Institute of Islamic Understanding Malaysia (iii)

PREFACE

(iv)

CHAPTER 1

THE ENVIRONMENT

Abu Bakar Abdul Majeed 1

CHAPTER 2

THE EARTH

Abu Bakar Abdul Majeed 11

CHAPTER 3

WATER

Abu Bakar Yang 17

CHAPTER 4

AIR

Abu Bakar Yang 31

CHAPTER 5

LAND

Abu Bakar Yang 43

CHAPTER 6

PLANTS

Abu Bakar Abdul Majeed 59

CHAPTER 7

ANIMALS

Abu Bakar Yang 65

CHAPTER 8

MAN

Abdul Monir Yaacob 83

CONCLUSION

88

FOREWORD

The impact on environment is not just determined by the number of people on Earth. Rather it also depends on how people behave and treat the environment. Many people talk about caring for the environment. Yet many more are not willing to change their lifestyle.



The Earth has plenty for everyone's need but not for everyone's greed. For too long mankind has treated the world as if they were the masters - clearing jungles, polluting rivers and seas, dumping rubbish indiscriminately, operating automobiles that pollute the air, etc.

It is the Department's goal to instil environmental awareness in the public. Special attention is given to the school children as they are the ones who are going to inherit this precious world. In the Seventh Malaysia Plan, dissemination of information is hoped to give a better understanding of the environmental issues. Everyone is entitled to experiences which will enable them to understand, analyse and respond to environmental problems they meet and which encourage committed participation through understanding.

It is only by the actions, commitment and energy of everyone that we can succeed in doing something good for our environment. Further and close co-operation with the Institute of Islamic Understanding has brought out the English version of the "Alam Sekitar Anugerah Tuhan". It is hoped that through this "The Environment - A Gift of God", the public is reminded that even religion is paying special and significant attention to the environment and encourage everyone to care for the unlimited resources it has given us, Insyallah!

Best Wishes.

A handwritten signature in black ink, reading "Rosnani Ibarahim", with a horizontal line underneath.

HAJAH ROSNANI IBARAHIM
Director-General
Department of Environment,
Malaysia

FOREWORD

The Institute of Islamic Understanding Malaysia (IKIM) is proud to participate in the publication of this book.

This book is an important publication for today's generation, especially when viewed from the aspect of providing education to the young generation in loving the environment and working towards safeguarding it.



The environment is a very valuable gift from God. Hence, the environment must be protected with utmost care. As a matter of fact, safeguarding the environment is a must for all mankind. In Islam, for instance, mankind has been reminded and instructed not to cause destruction on the face of the Earth.

The phrase "cause destruction on the face of the Earth" stresses the importance for mankind to utilise this gift from God with care and moderation. Water, air, plants, hills and mountains cannot be simply wasted, what more destroyed.

Safeguarding the environment, including protecting the beauty and cleanliness of the environment, is a duty that must be carried out by man. The act of polluting the environment is against the values and ethics of any religion.

It is hoped that the articles in this book would assist students in particular and readers in general to understand issues pertaining to the environment as well as to appreciate fully this gift from God.

Thank you.

A handwritten signature in black ink, appearing to be 'Ismail Bin Haji Ibrahim'. The signature is stylized and cursive, with a large loop at the beginning and a long, sweeping tail.

DATO' DR. ISMAIL BIN HAJI IBRAHIM
Director-General
Institute of Islamic Understanding Malaysia.

PREFACE

Assalamu'alaikum Warahmatullahi Wabarakatuh.

The original Bahasa Malaysia version of the book “The Environment - A Gift of God” appears to have been warmly received by students and the general public. This may be due to the slightly different approach taken by its authors in looking at the various issues of the environment. The approach is from the religious angle.

It is now generally accepted that religion plays a crucial role in enhancing the awareness on the need to conserve the environment. How man treats the environment depends very much on his relationship with God. God has created the environment for man to share with other living organisms. At the same time, man is accorded the responsibility of looking after the environment. By accepting this responsibility means that he is willing to establish a serene relationship with the Creator.

Although there is a consensus among world's major religions on the conservation of the environment, the Islamic perspective has been chosen as the theme of this book. Therefore, relevant verses of the Holy Quran have been incorporated. The translation of these verses are that of Abdullah Yusuf Ali's The Meaning of the Holy Quran (Amana Corporation, 1989). Very slight modifications have been made to cater for the level of understanding of secondary school students in this country.

The publication of “The Environment - A Gift of God” would not have been possible without the joint effort of several individuals and organisations. We would first like to accord our appreciation to the Honourable Tan Sri Dato' Seri (Dr.) Ahmad Sarji bin Haji Abdul Hamid and Dato' Dr. Ismail Haji Ibrahim, IKIM's Chairman and Director-General respectively; and Puan Hajah Rosnani binti Ibarahim, Director-General, Department of the Environment, Malaysia (DOEM), for their inspiration and support for the project.

Secondly, we thank these organisations for donating some of the photographs that we have used in the book, in order to capture and sustain the interest of young readers: Facts On File Incorporated, New York and Oxford; The New Straits Times Press (Malaysia) Bhd.; Dewan Bahasa dan Pustaka; and Kumpulan Akhbar Watan Sdn. Bhd.

Thirdly, we wish to express our sincere gratitude to Mr. Shaikh Mohd. Saifuddeen Shaikh Mohd. Salleh, IKIM' research officer, and Ms. Tunku Khalkausar Tunku Fathahi and Zainab Zubir, officers at the DOEM, for editing the book.

Fourth, we recognise the hard work put in by the coordinators of the project, namely Mrs. Zawiah Mat Sari of IKIM and Ms. Tunku Khalkausar at DOEM. The secretarial and technical assistance of Ms. Wan Azlinawati Wan Othman and Mr. Zabidi Abu Kassim in the preparation of the book are also gratefully acknowledged. We also extend our thanks to other IKIM and DOEM personnel for their contribution, direct or indirect, towards the successful completion of this project.

Last, but not least, we appreciate tremendously the generous fund provided by the Malaysian Government for the publication of the book.

It is our hope that this book would benefit the readers, both students and the public. God be praised! Wassalamu'alaikum Warahmatullahi Wabarakatuh.

Dr. Abu Bakar Abdul Majeed
Senior Fellow, IKIM

18 December, 1998
29 Sya'ban, 1419

THE ENVIRONMENT

BY
ABU BAKAR ABDUL MAJEED

“Do you not see that Allah makes the clouds move gently, then joins them together, then makes them into a heap? Then you will see rain issue forth from their midst. And He sends down from the sky mountain masses of clouds wherein is hail: He strikes therewith whom He pleases and He turns it away from whom He pleases. The vivid flash of His lightning well-nigh blinds the sights”.

Surah An-Nur: verse 43

INTRODUCTION

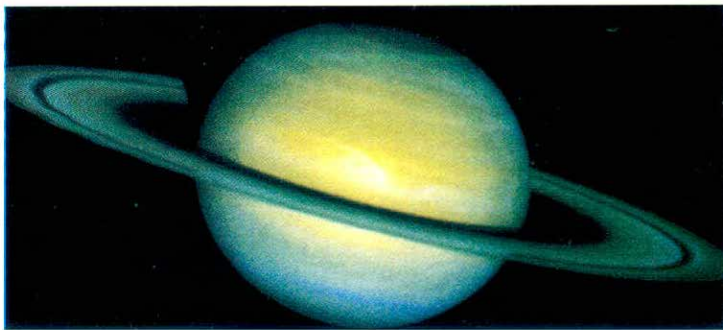
Have you ever wondered about the universe where we live in? What is its origin? The universe is created by God. Therefore, it is also one of His subjects. The universe is made up of both tangible or seen, and intangible or unseen, worlds. The tangible world is the physical world. It can either be detected by the senses, or be perceived by the mind. The intangible world can neither be detected by the senses, nor be perceived by the mind. The world of the spirits and the hereafter are examples of the intangible world. The existence of the intangible world can only be understood and accepted by a strong belief in God the Creator.



God has created the physical world for the benefit of mankind. It is made up of many components. Planets, moons, stars and galaxies are some of the components of the universe. Only God knows how many planets, moons, stars and galaxies there are today. Planet Earth belongs to a galaxy known as the Milky Way. There are a billion stars in the Milky Way. The sun is the star of the solar system. Apart from Earth, the other planets in the solar system are Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Pluto. There are billions of other galaxies, with their own stars. All the planets are constantly moving. For example, the Earth moves on its own axis, while circulating or orbiting the sun. At the same time, the sun and its planets are moving in its galaxy. All the galaxies move according to the prescribed orbits set by God the Almighty.

BIOSPHERE

Does life exist throughout the universe? Until today, Earth appears to be the only planet that can support human, animal and plant life. Studies and explorations into space have not been able to show that life exists anywhere else in the entire universe. All lifeforms are found within a thin layer around planet Earth. This layer is situated between the molten heat of the Earth's interior and the cold immensities of the space. This layer is known as the biosphere. It stretches



Saturn

from the depths of the oceans to the highest point that is about 15 km² above the sea level. In theory, the biosphere is what we call the environment.

A large variety of living things are found in the Earth's atmosphere. About 71% of the Earth's surface is covered by water. This provides the conditions that make life on Earth's possible. The rest of the Earth's

surface is made up of land. However, not all the land can support human life. About a third of the land surface is arid, or semi-arid. The other 11% is permanently under ice, such as most of the North Pole (the Arctic) and South Pole (the Antarctic). Another 10 % of Earth's land is tundra, where living is extremely difficult. Therefore, less than half of the total land area is available for human settlements, agriculture and forest reserves.

Apart from water and land, the Earth's environment is also made up of air. Air consists of gases such as nitrogen, oxygen and carbon dioxide. These gases should be maintained at a certain proportion. Otherwise, life would be uncomfortable. For example, 21% of the air is oxygen, 78% nitrogen and 0.03% carbon dioxide. Oxygen concentration gets less as we move higher in the atmosphere, such as flying at high altitude. Lack of oxygen can cause breathing difficulty and unconsciousness. You probably have experienced breathing discomfort when climbing the mountain. That is why mountain-climbers and fighter-jet pilots need to carry oxygen tanks.



BIOMES

In the biosphere, three major components namely land, water and air, provide the support for human, animal and plant life. However lifeforms of a particular place depend largely on the suitability and height of the land, the availability of water resources and the air temperature. The study of the relationship between lifeforms and the environment is known as ecology. The world is divided into fourteen main ecological regions. These regions are also known as biomes. Have you ever seen photographs of the different biomes?

According to the United Nations Educational, Scientific and Cultural Organisation (UNESCO), biomes are divided into;

- | | | |
|---|---|--|
| Tundra communities and barren arctic deserts | – | for example, the Arctic and the Antarctic |
| Temperate needleleaf forests or woodlands | – | for example, Northern Canada |
| Temperate broadleaf forests or woodlands and sub-polar deciduous thickets | – | for example, Northern Japan and Central Europe |
| Temperate grassland | – | for example, Southern Russia |
| Cold winter deserts and semi-deserts | – | for example, Iran and Afghanistan |
| Evergreen Sclerophyllous forests, scrub or woodlands | – | for example, Spain |
| Tropical grasslands and savanna | – | for example, Central Brazil |
| Warm deserts and semi-deserts | – | for example, Western Australia |

- Tropical dry or deciduous forests (including monsoon forests) or woodlands – for example, India
- Sub-tropical and temperate rainforests or woodlands – for example, New Zealand
- Tropical humid forests – for example, Malaysia
- Mixed mountain and highland systems with complex zonation – for example, the Himalayans
- Mixed island systems – for example, Indonesia and the Philippines
- River and lake systems – for example, North America and the Caspian sea

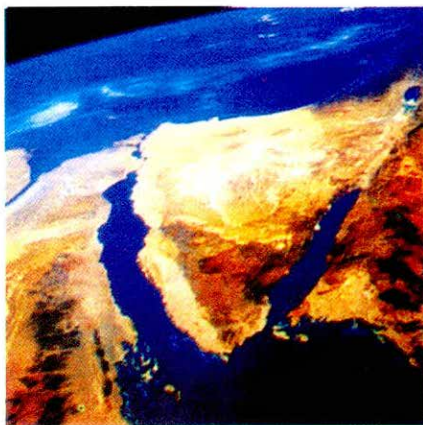
COMPONENTS OF THE ENVIRONMENT

The discussion on the environment involves several issues related to its components. These are; the Earth, man, plants, animals, water, land and air. You can read more about these components in the following chapters. Below is a brief introduction to the various components of the environment.

Earth

Scientists estimate that the Earth was born about 4.6 billion years ago. According to one theory, the Earth was probably formed through the collision of clouds of dust and gas, and clumps of dense materials. These matters were suspended in space after a major explosion that occurred 15-20 billion years ago. This explosion is known as the Big Bang.

The Big Bang gave rise to the formation of planets, stars, moons and other heavenly bodies. There appeared to be a force of attraction, like the gravitational force, which brought together the suspended materials to form stars and planets. Until today, billions of matters in space still remain in their respective orbits, without colliding or reversing the direction of movement. Surely, God the Almighty ensures that the motion of the heavenly bodies within the cosmos takes place in an orderly manner.

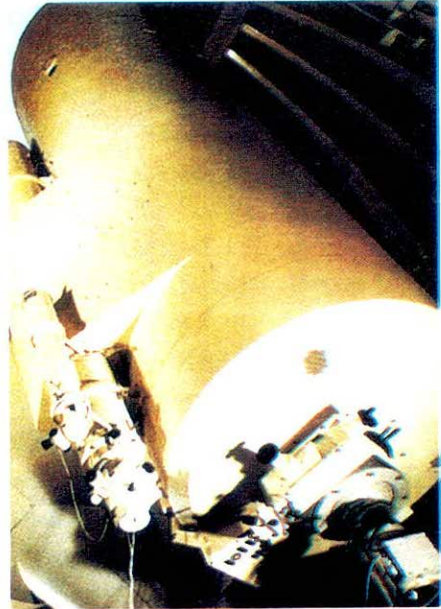


An aerial view of the Earth's surface

For example, in the Milky Way, millions of heavenly bodies maintain their positions in a steady state. You too, could witness some of these heavenly bodies if you looked at the sky on a clear night. Such a beautiful and captivating sight of the galaxy can be seen better from the top of the hills and mountains. Astronomers normally build observatories on hills and mountains to monitor the characteristics and movement of cosmological bodies by using the telescope.

Space explorations, either by manned or unmanned spacecraft, give us a lot of information about the Earth and its universe. The Earth is like an oasis situated in the middle of this huge universe. The photographs of the Earth captured from space clearly show how fragile the planet is.

For example, surrounding the Earth is a thin gaseous layer known as the ozone layer (each ozone molecule consists of three oxygen atoms). The ozone layer filters the potentially dangerous ultra-violet ray of the sunlight from reaching the Earth's surface. Studies in the early 1980's found that in certain parts of the world, such as the Antarctic, the ozone layer is becoming thinner. These findings were later confirmed by studies conducted through satellites launched into space.



A huge telescope to study the cosmos

Man

Do you know how many people are there in the world today? The world's population now is around 6 billion. The rate of population growth is about a quarter million people per day. At this rate, when Malaysia achieves a developed nation status in the year 2020, the world's population is expected to be almost 10 billion. The question is: can Earth support such a large number of people? The answer is: Yes it can, provided the population is more equally distributed. Today, many third world countries are over-populated. These countries normally have very limited resources, in terms of food and other basic needs, to provide for their large population. Therefore, we constantly hear about the problems of starvation, homelessness and plague being widespread in these communities. A more equitable distribution will ensure a better living condition for everybody in this world.

What is the population of this country? Malaysia's current population stands at 26 million. As far as man is concerned, it is not the quantity that matters but rather, the quality. Man has a heavy responsibility in this world. As he has been bestowed with the mind and a higher mental capability, as compared to the other living things, man are expected to play the role of a vicegerent, or God's representative, in this world. The Almighty has created this world for man to share with the animals and plants. Man is but one of the millions of species of living things on the face of the Earth. They are all created by God the Almighty.

Animals

Animals too are the creations of God the Almighty. There are millions of species of animals in the world. In general, animals can be divided into two main groups, namely wild animals and domestic animals. Domestic animals can be a source of food for man. They may also provide specific services, such as to carry goods and man from one place to another, to guard houses or, as pets. Each one of them must be properly looked after. The meat from certain animals may be eaten after being duly slaughtered. Man must take great care in looking after the animals because

he has been entrusted with such a responsibility as God's vicegerent. The welfare of animals must be protected as they also have an instinct and can feel pain.

Animals also live as a community. There exists a "mother-child" relationship among them. Therefore, their breeders or owners must know this.

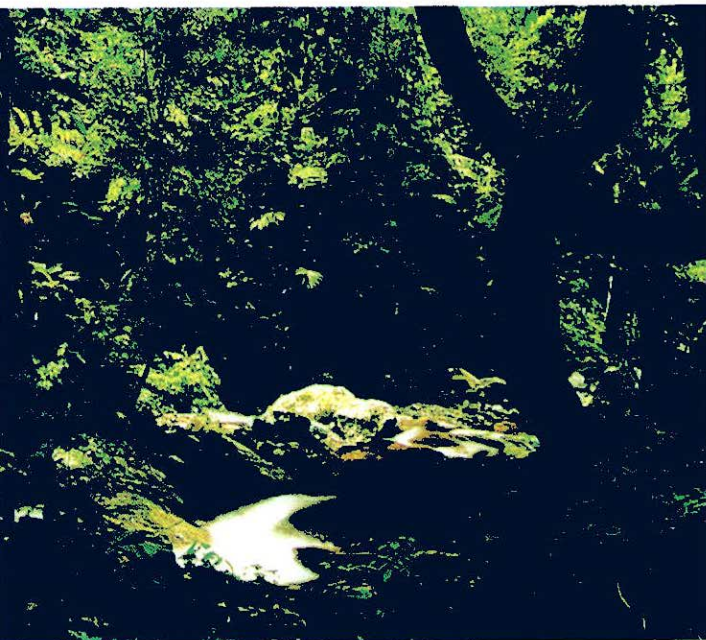
Wild animals also have rights. Due to man's irresponsible actions, many species of animals are nearly extinct. Indiscriminate hunting has wiped out certain species of animals. For example, there are species of whales that are on the brink of extinction due to excessive whaling. The survival of certain species of eagles is also threatened. Therefore, many species of animals are gazetted protected animals to avoid extinction and encourage propagation.



An eagle threatened with extinction

Prophet Muhammad (peace be upon him) said, "doing good to animals is of equal importance to doing good to humans. And doing evil to animals is of equal meanness to doing evil to humans". The Prophet himself reserved a resting area for his battle horses. This area which was six-mile long and one-mile wide was located around the city of Madinah. It was known as Hema.

The first Caliph of Islam, Sayyidina Abu Bakar Al-Siddiq advised his soldiers who were going to war not to destroy plants and animals, unless for food. A Muslim scholar of the eighth century, Al-Jahiz wrote a book entitled 'The Book of Animals'. In it, he discussed animal behaviour and how the environment influence animal life. Izzad-Din Abd's Salam also wrote a book on animal rights in the thirteenth century.



Plants produce oxygen, cool the climate and protect water sources

PLANTS

Have you ever seen a photo of the desert? How would you feel if you have to live in the hot desert that has no trees? Living in a desert is very difficult indeed. Deserts lack trees and rivers as water sources. In Malaysia we are lucky because God the Almighty has bestowed us a wide range of plants.

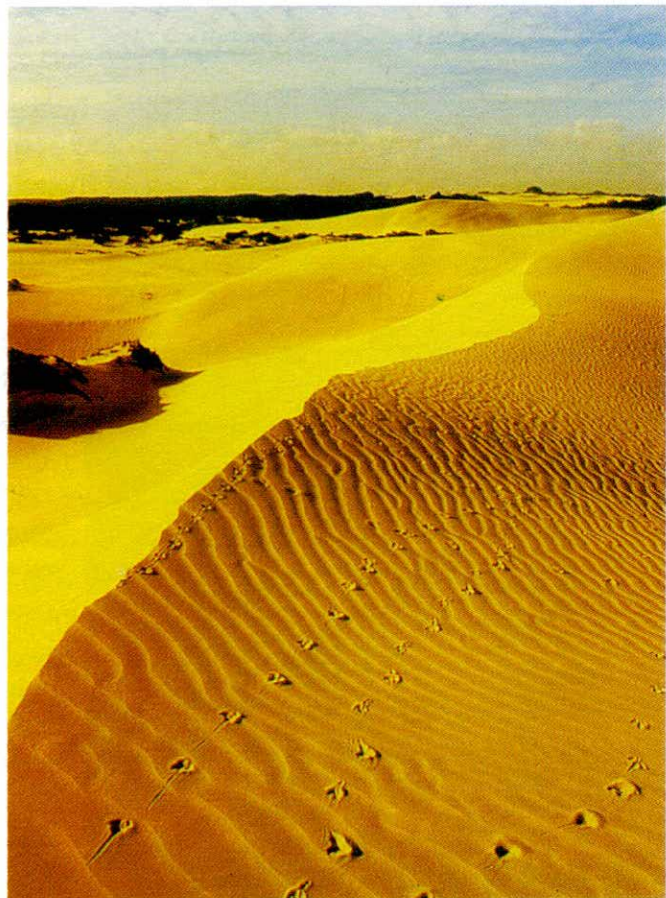
Do you know that a third of the Earth's surface is covered with plants? Plants are important because they moderate the climate, protect water sources, and provide shades for animals and man. Plants are an important source of food for man and animals. Plants are the only God's creations that can self-produce food. Their leaves absorb carbon dioxide and release oxygen. This action is vital in order to keep the proportion of gases in the air constant. Therefore, the world's temperature and climate is kept in check. Plants also provide natural medicinal products. For example, about 2000 out of the 3000 plant species believed to have cancer-curing property are found in the Amazon jungle in South America.

According to Islamic laws, forests and the animals in them can be designated as forest reserves. Forest reserves are restricted areas. These areas normally include the forest and its surroundings that provide water for of its trees. For a developed area, like a village, a forest reserve also includes the surrounding areas used as a source of income and recreation for the villagers.

LAND

Land makes up 30 % of the Earth's surface. However, only a little of the land surface can support human life. About a third of the land surface is arid, or semi-arid. Another 11 % is permanently under ice, such as in the Arctic and the Antarctic. The other 10% of land is tundra. Therefore, less than half of the land surface area is available for human settlements, farming, cultivation and forest reserves.

There are about 15 billion hectares of land on the Earth's surface. However, only 1.5 billion of this is suitable for human settlement or agriculture. The other 13.5 billion hectares are too dry and present serious obstacles to human settlement. Although 36.5 billion hectares of the Earth's surface are covered with water, 97 % of it is saline or salt water. Salt water is not suitable for man, as well as animals and plants that survive only on land.



A third of the Earth's land is arid and semiarid

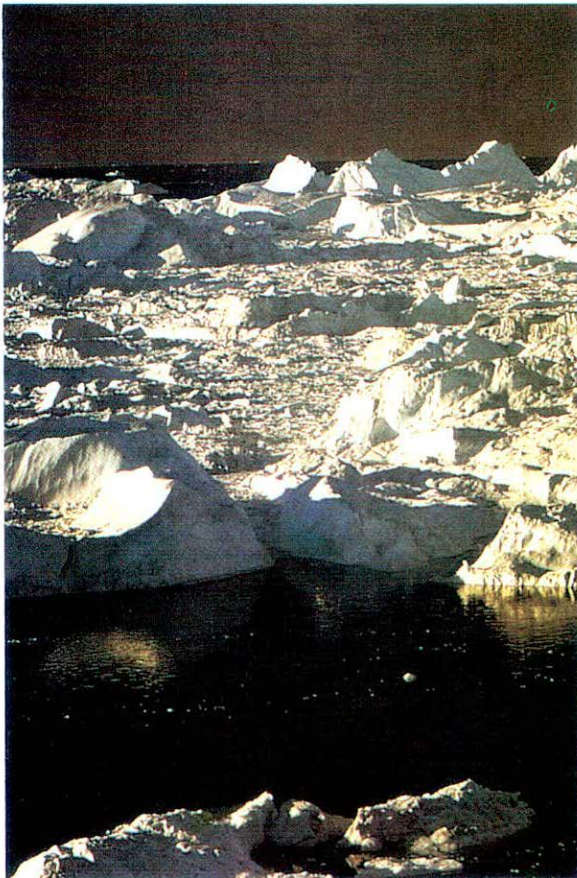
Apart from providing shelter for plants and animals, the land is a rich source of natural products. Natural products may be found on the Earth's surface, such as salt and antimony. Tin, gold and silver are found underground. Some areas are rich in fossil fuels such as petroleum. Their natural resources are considered national property. They ought to be shared by everyone in a just manner.

Nowadays there are various programmes aimed at expanding land for development. In view of land shortage, there are now efforts to reclaim coastal areas, ex-mines and deserts. This method of expanding land is known as *al-mawat*. It is allowed as long as it does not cause harm and destruction to the society and its environment.

Reclamation projects have been carried out north of Jakarta (8,750 hectares), west coast of Taiwan (2,200 hectares), Pulau Jurong in Singapore (1,790 hectares), Kansai International Airport in Japan (511 hectares) and Chek Lap Kok Airport in Hong Kong (200 hectares). In the next few years a total of 97,000 hectares of coastal land will be reclaimed from the 4,800 kilometer-long shores of Malaysia. Perak and Selangor will reclaim 6,804 and 4,047 hectares of coastal land respectively. Efforts will also be made to reclaim 210,000 hectares of ex-mining land in Malaysia. The reclaimed land will be used for agriculture, aquaculture, housing, industry, tourism and infrastructure development, such as building airports and bridges.

Water

Do you know that a large portion of the human body is made up of water? The Earth too, has more water than anything else. When seen from outer space, it seems like a ‘water’ planet, as 71 % of its surface is covered with oceans, rivers and lakes. However, most of the water is salt water. Salt water is not drinkable, and therefore does not support human, animal and plant life. Most of the Earth’s freshwater exists as ice in the polar regions. The remaining source of freshwater



is found deep underground. Actually, only 0.6 % of water on the Earth’s surface is readily available for man and animals to share. Even though this percentage is low, the amount of water is rather big. It is estimated that the Earth’s surface receives 113,000 billion m³ of water as rainfall and snow annually. This is one of the most important gifts of God the Almighty to mankind.

However, the problem of water shortage still persists. Almost 2 billion people from 80 countries experience continuous water shortage problem. Have you ever experienced water rationing? You must have felt how tough it is to live without water. Think of your friends in other countries who face the water problem daily.

Most of the Earth’s freshwater is found as ice in the Poles

Water supply to their homes is not always guaranteed. They have to walk several miles daily to collect water. Luckily, in Malaysia we only need to turn on the tap, and water immediately gushes out.

Apart from water shortage, the problem of water pollution is also becoming serious. It is estimated that everyday 25,000 people are infected with diseases from using contaminated water. The contamination is due to rubbish, faeces and toxic wastes from industries and farms. Contaminated water may flow from one country to another. The people of the second country may then use the contaminated water for bathing, washing clothes, drinking and to prepare food. Therefore it is not surprising that they are constantly exposed to the dangers of water-borne diseases. Annually, it is estimated that 20 billion tonnes of dirty water flow from the lakes and rivers and into the sea. This is how food resources from the sea can be contaminated. This would definitely affect those whose income depend on the sea, for example, fishermen.

Air

Do you remember the haze that engulfed many parts of Malaysia in the middle of 1997? How was the air quality that we breathed in at that time? Your throat probably did not feel comfortable when breathing. Clean air is an important component of the environment. The Earth's atmosphere is made up of gases such as nitrogen, oxygen, carbon dioxide and others. These gases must be maintained at a certain composition. Otherwise, the air that we breathe will cause discomfort to the body. For example, oxygen is maintained at 21 %, nitrogen at 78 % and carbon dioxide at 0.03 %. The oxygen content of air gets less as we move higher in altitude in the atmosphere, like climbing the mountain or flying. Malaysian mountain-climbers who successfully captured Mount Everest in 1997, had to bring their own oxygen supply in tanks. They had to use the oxygen from the tank as the oxygen content in the surrounding air was too low.



A mountain-climber carrying his own oxygen supply

The air in our environment is now exposed to various contaminants. Toxic gases from indiscriminate burning of fuels and uncontrolled manufacturing activities have caused much damage to the air around us. Gases like carbon dioxide, methane and chlorofluorocarbon can create a barrier that will increase the Earth's surface temperature. This phenomenon, known as the 'greenhouse' effect, can cause global warming. Scientists expect that the average temperature of the Earth's surface will increase in the next 50 years. Such an increase in temperature may thaw the snow in the North and South poles, causing flood in low lands.

The other problem arising from the release of toxic gases, like chlorofluorocarbon, is the thinning of the ozone layer. The ozone layer that covers the Earth acts to reflect sunlight's ultra-violet radiation. The radiation is dangerous as it causes discomfort and skin cancer. Thus, the thinning of the ozone layer has exposed the atmosphere to the ultra-violet radiation. The use of chlorofluorocarbon shall be stopped by the year 2000.

The haze that was seen in Malaysia in 1997 made the air quality at the time unsatisfactory. The Air Pollutant Index of many major towns was at a critical level. Efforts were immediately taken to solve this problem. The people of this country were urged to be sensitive to activities that may worsen the haze, such as open burning. They must continue to co-operate with the authority by practising a safe and healthy lifestyle, and not polluting the environment.

CONCLUSION

The Earth and its environment have been created by God the Almighty. Man has been given the responsibility of caring for the environment. In a way, the present generation has to ensure that the environment that they leave for the future generation is intact. Therefore, we must strive to "return" the environment to our children in its best possible form.

It is He who created the heavens and the Earth in true proportions: The day he says, "Be," Behold! It is. His word is the truth. His will be the dominion the day the trumpet will be blown. He knows the unseen as well as that which is open. For He is the Wise, well-acquainted with all things.

Surah al-An'am 6: verse 73

He created not the heavens, the earth, and all between them, merely in idle sport; We created them not except for just ends: but most of them do not understand.

Surah ad-Dukhan 44: verses 38-39

To Him belongs what is in the heavens and on earth, and all between them, and all beneath the soil.

Surah Ta-ha 20: verse 6

It is He Who has made you His agents, inheritors of the earth: He has raised you in ranks, some above others: that He may try you in the gifts He has given you: for the Lord is quick in punishment: yet He is indeed Oft-Forgiving, Most Merciful.

Surah Al-An'am 6: verse 165

He has created man: He has taught him speech and intelligence. The sun and the moon follow courses exactly computed; and the herbs and the trees - both alike bow in adoration.

Surah Al-Rahman 55: verses 3-6

THE EARTH

BY
ABU BAKAR ABDUL MAJEED

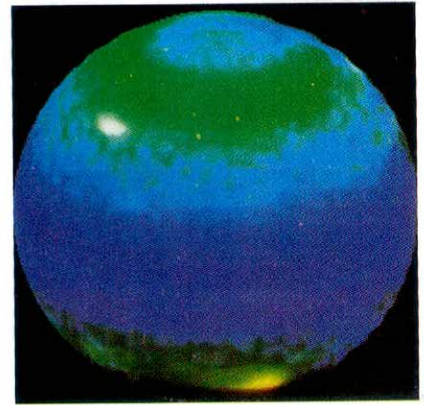
He merges night into day, and He merges day into night, and He has subjected the sun and the moon to His Law: each one runs its course for a term appointed. Such is Allah your Lord: to Him belongs all dominion. And those whom you invoke besides Him have not the least power.

Surah Faathir: verse 13

Have you ever looked at the sky on a clear night? You must have seen the moon and the stars. If you use a telescope, you can also see planets. Life appears to exist only on planet Earth. Until today, space explorations have yet to find living things on the other planets.



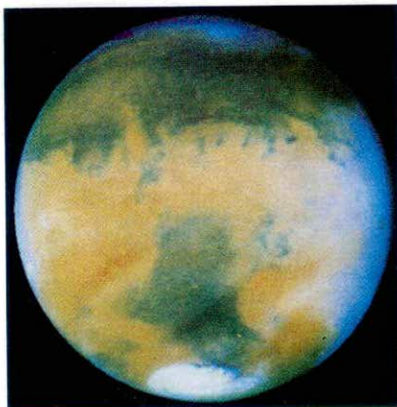
The Earth can support human, animal and plant life because it has a biosphere. The biosphere contains air and moisture that are suitable for life. The Earth receives 0.002 % of the Sun's total output. However, this amount is enough to sustain human, animal and plant life. The heat and light from the sun have also kept the Earth's surface temperature at an average of 13°C for the last 2 billion years. This moderate surface temperature allows living things to grow and propagate.



Jupiter

The main gases found within the Earth's atmosphere are different from those of the other planets. The concentration of oxygen (21 %) and nitrogen (78 %) is very suitable for life. Living things can live comfortably on Earth. About 4 billion years ago, the Earth's atmosphere contained more than 25 % carbon dioxide. This condition still exists on Mars and Venus today. It does not support life.

Over the years, the 25 % carbon dioxide content of the Earth's atmosphere has gradually decreased. It is replaced by oxygen. Ancient lifeforms may have contributed to the change from carbon dioxide to oxygen. Today, carbon dioxide makes up only 0.03 % of the air. But it is still important for photosynthesis.



Mars

Water is a basic need of life. The world water supply is about 1.4 billion km³. Water has many uses. Apart from drinking, water is used to wash clothes and for bathing. Rainwater is a godsend to the Earth's population. More than 3 billion people in Asia depend on the monsoon that comes between June and December yearly.

Rain is an important source of water to the farmers. During the drought, the land may become very dry. Plants and animals will not have enough water and may die. When the monsoon comes, water sources and the paddy fields will be filled up. Farming activities can then be started. The rain normally brings with it renewed hope and promise for a better life for the farmers and breeders.

Lakes, rivers and oceans are the 'roads' that connect people, societies and countries. Passengers and goods are easily transported from one place to another. When modern water transports are introduced, there is an increase in trade and tourism. Lakes, rivers and oceans also provide food for man. Seafood such as fish, prawns, crabs and cuttlefish is indeed delicious. The cleanliness of lakes, rivers and oceans is important to fishing communities. Otherwise, the fisherman's income will be affected.

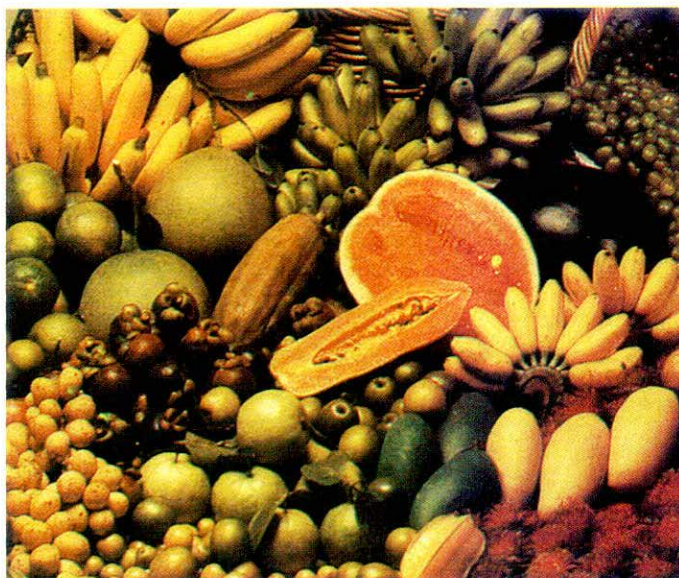
Part of the land on the Earth's surface can be used for agriculture. Many species of plants grow healthy. They are an important source of food for both man and animals. Agriculture is one

of the first organised activities carried out by the ancient communities. Farming communities are considered as the pioneers of human civilisation. Even to this day, agriculture is still the primary source of food for man.

In Malaysia, for example, land is used to plant paddy, fruits and vegetables. Agriculture also gives rise to commerce and industry. Rubber and palm oil product contribute to the country's economy. The forest is also an important source of food and medicine, as well as for improving the economy. Wood is used to build houses and make furniture. Paper used to make books and newspapers also comes from the trees in the forest.

Fossil fuels like petroleum and coal are found deep underground. Fuel is important for human use. It is estimated that every second, 1,000 barrels of petroleum are burnt for the various purposes, such as to run engines and turn electric power turbines. If petroleum is continuously used at this rate, the world may run out of petroleum by the year 2020. Fossil fuels take millions of years to form from the compression of dead plants and animals. Sadly, mankind takes only a few decades to use them up.

There are many types of minerals in the Earth's crust. Minerals such as gold, silver, zinc, iron, antimony and copper are mined on a large scale in some parts of the world. Minerals are important in manufacturing and construction industries. Some are used as catalysts in chemical reactions. Radioactive elements, such as uranium, are extracted from the Earth's crust for their nuclear energy. Nuclear energy can be used in meaningful ways, such as to operate electrical generators. In this case, nuclear energy is cleaner and more efficient source of energy than fossil fuels.



Fruits are an important source of food

It is clear that not only does the Earth support life, but from its sky right down deep into its crust, it fulfils mankind's numerous needs. Therefore, we must look after the Earth as best as we can. Neil Armstrong, the first person to walk on the moon, described the Earth with its deep blue oceans, brown-green continents and swirling veil of dazzling white clouds as a beautiful jewel in space.

The view from the moon as described by Armstrong shows how fragile the Earth is. The Earth appears to be exposed to all sorts of dangers and threats. Actually, the biggest threat to planet Earth comes from man himself. Today, the change in the Earth's ecology due to man is far worse compared to the disaster that happened 65 million years ago, which caused the extinction of dinosaurs.

If pollution on planet Earth continues unabated, it is estimated that one-third of its plants and trees will be destroyed in the next 40 years. One-seventh of the Amazon jungle has been cleared, while 50,000 km² of forest is destroyed each year. Indiscriminate logging to get a quick profit is the main reason for the destruction of primary forests of the world, such as those found in the Tropics, North America, Central Europe and Eastern Russia.

The use of fossil fuels such as coal and petroleum by more than 600 million cars all over the world, has increased air pollution to a disturbing level. Polluted air causes in many complications. For example, toxic gases in the air when mixed with the rain, fall as acid rain. Acid rain contaminates water catchment areas and endangers lives in their vicinity.

Emission from factories and industrial activities threatens the ozone layer. The ozone layer is important to repel the ultra-violet component of sunlight that can be harmful to man from the Earth's atmosphere. Skin cancer may inflict those exposed to ultra-violet radiation.

Some gases cause global warming on the Earth's surface. This phenomenon is known as the 'greenhouse' effect. The greenhouse effect is a catalyst to the change in the climate and wind direction. This change may create storms and hurricanes, which can destroy houses, plantations and livestock. Many people would suffer, such as losing their homes and being threatened with starvation.



The biggest threat to Earth comes from man

Man used to think that the space and natural resources available on the Earth's surface are limitless. Thus, with greed and rage they carried out all sorts of activities to extend their boundaries and exploit the resources to the maximum. Now man has realised that Earth's resources are limited. Unfortunately, man continues to exploit these resources.

The Earth is a gift of God the Almighty for man to manage and prosper. This concept is known as the concept of vicegerency or stewardship. Each human generation is reminded of the fact that the Earth is something which they have "borrowed" from the future generation. This means that, they must return it intact to the rightful owner, that is, their children and grandchildren before they die. This would make them realise that they should not abuse Earth's contents, including the environment

Have you ever borrowed anything from your friends, teachers, or neighbours? What should the condition of the item be when you return it to its owner? Surely you would feel ashamed if you had spoilt or damaged the item. Your friend, teacher or neighbour too, would be disappointed if the things they had lent you were spoilt or damaged. They would think that you were not honest, and therefore could not be trusted.

The same is true for the Earth that we have "borrowed" from the future generation. Before we return it to its "owner", we must ensure that its environment is neither polluted nor spoilt. This is vital as the next generation can learn from us and act accordingly to preserve the Earth's environment. It is then their sacred duty to "return" it to the generation that comes after them.

WATER

BY
ABU BAKAR YANG

And We send down water from the sky according to due measure, and We cause it to soak into the soil; and We certainly are able to drain it off with ease. With it We grow for you garden of date palms and vines; in them you have abundant fruits, and of them you eat and have enjoyment.

Surah Al-Mu'minin: verses 18-19

Water is a basic need of man, and is said to be the source of life for all living organisms in this world. However, have you ever thought of the importance of water and its role in supporting life? If we look at the world map, we shall see that most of the Earth's surface is covered with water. About 71 % of the Earth's surface is made up of oceans, holding about 1.4 billion km³ of water. If rivers, lakes, glaciers, and the North and South Poles are included, the area covered with water is close to 40 billion hectares. This accounts for 74 % of the Earth's surface.



However, only a tiny percentage of Earth's water is suitable for drinking. The Quran mentions the importance of water to humans, such as for drinking, in verse 27 of Surah al-Mursalaat.

And We made on Earth mountains standing firm, lofty in stature; and provided for you water, sweet and fresh.

Demand for water grows as population and individual need increase. Between now and the year 2000, water withdrawals will increase by 2-3 % annually. Although water is replaced through the water cycle (figure 3.1), the time taken for replacement depends on the original source of water; atmospheric moisture is replaced within 12 days, river within 20 days, but deep groundwater sources can take several hundred years to replenish after water has been withdrawn. The following are factors that are threatening the world's water supplies;

- ❑ Water is treated as an infinite resource and used wastefully especially in the developed world where water use is excessive.
- ❑ Groundwater supplies tapped without control for drinking and irrigation water, are being used up faster than they can be replenished.
- ❑ Toxic waste from industry, sewage from human settlements and excess pesticides and fertilisers from agriculture are polluting rivers and lakes and poisoning water supplies. For example in October 1997, the water cleaning facility at the Langat River had to be temporarily closed, when the activities of nearby factories accidentally spilled diesel into the river. This caused disruption in the water supply to several areas in the Klang Valley.

WATER POLLUTION (Figure 3.2)

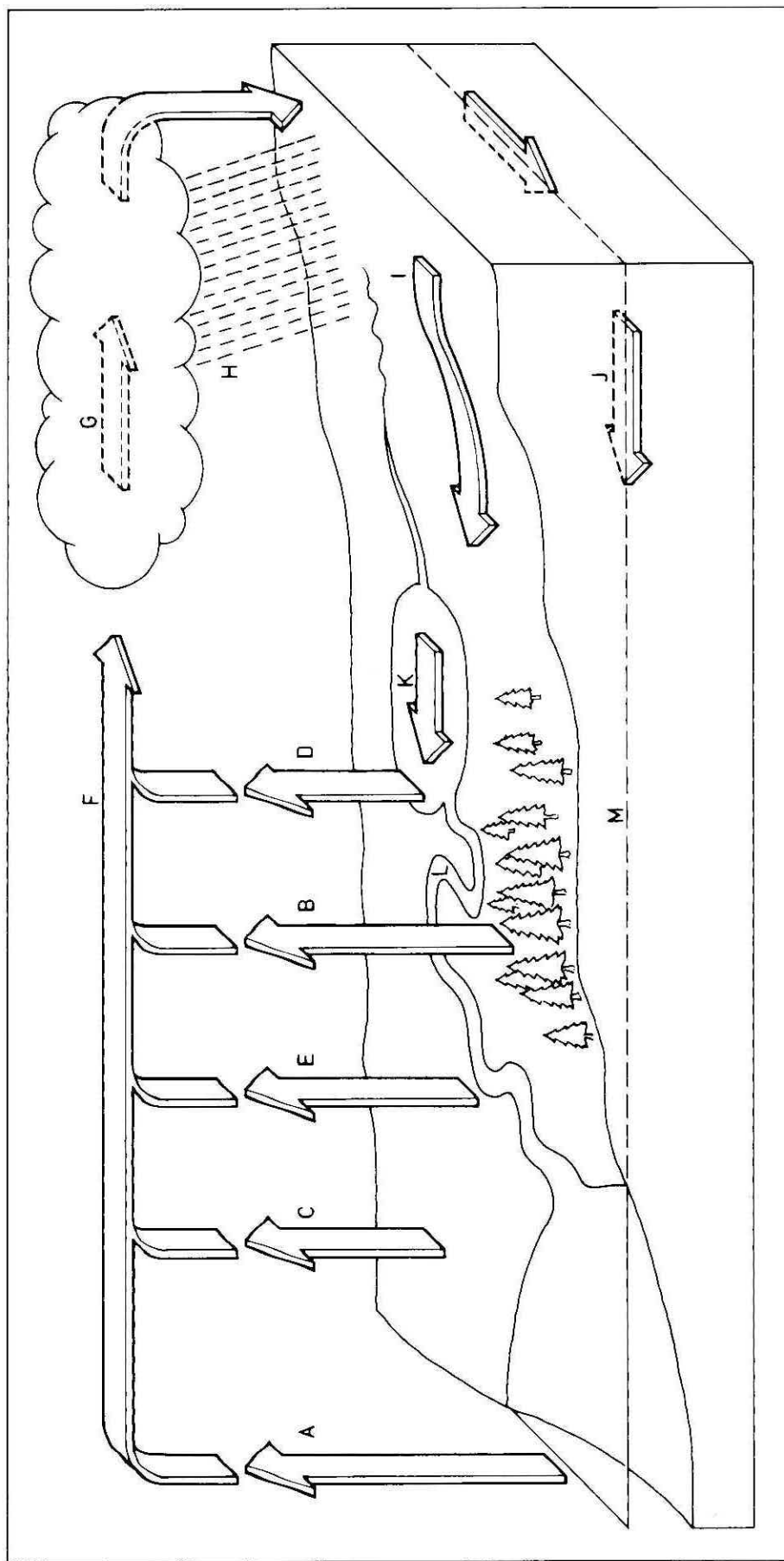
Pollution of oceans

Because of their size and depth, the world's oceans have long been regarded as having an infinite capacity to absorb dumped waste. Some of the things commonly disposed into the sea are man and animal wastes, rubbish, industrial wastes, oil, hazardous chemicals and even nuclear waste. The assumption has always been that any pollutants are diluted sufficiently so as to pose no threat to human health or the environment. This is not true, as the sea can also be polluted. As we approach the new century, many countries are striving to become developed, therefore ignoring the safety and care for the environment, especially the sea.



Ocean polluted with oil slicks

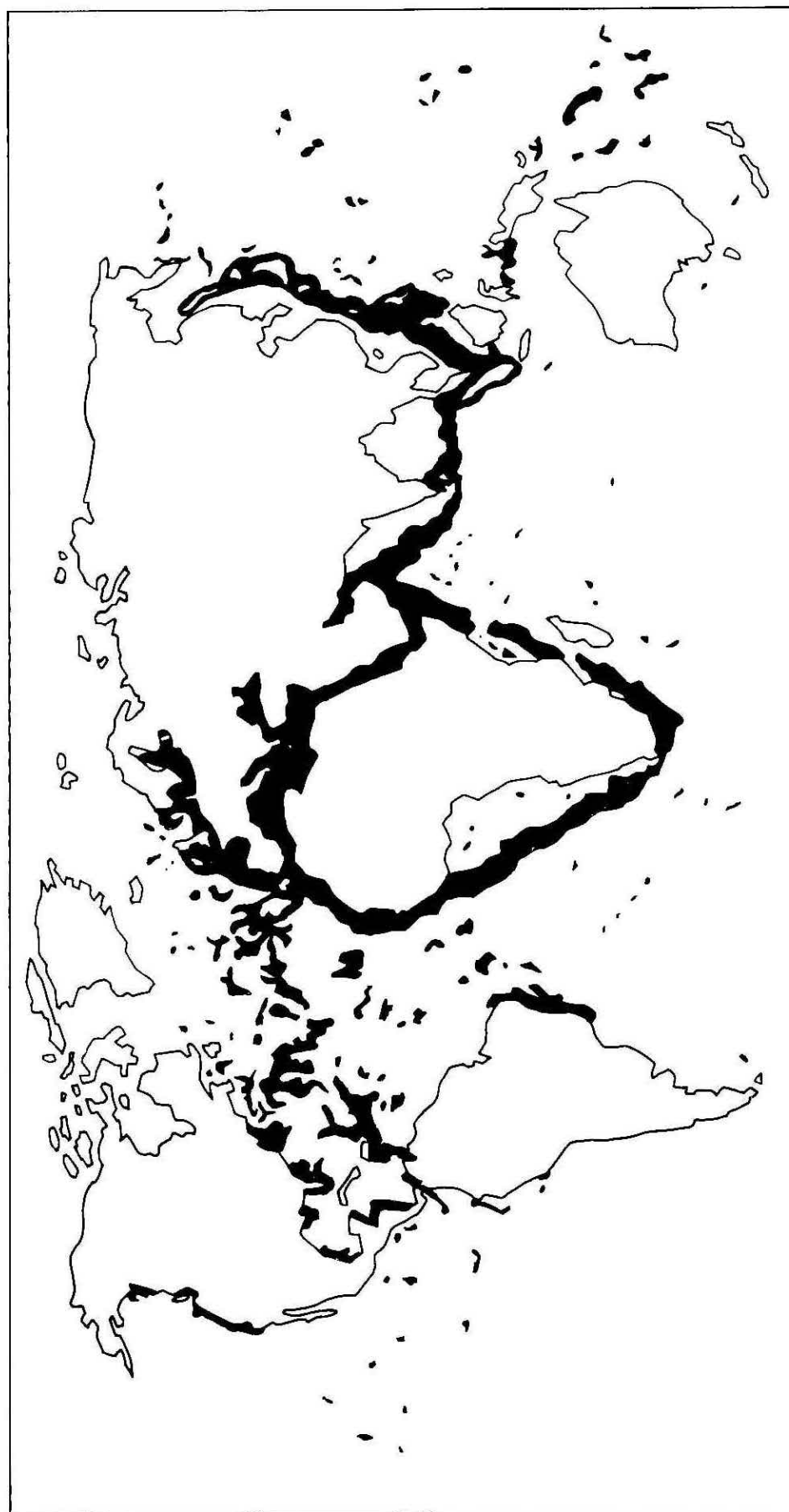
Figure 3.1: The Water Cycle



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- A-E** Evaporation
- A** Sea
- B** Vegetation
- C** Soil
- D** Lakes
- E** Rivers
- F** Morning water vapor
- G** Condensation
- H** Precipitation
- I** Surface runoff
- J** Groundwater
- K-L** Flow through lakes and rivers
- M** Water table

Figure 3.2 Oil Pollution



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Visible oil slicks in the late 1980s

Major oil shipping routes are visible from the pollution tankers leave behind. Floating oil released by accidental spillage or deliberate tanker cleaning destroys marine life

Sea pollution can also be due to human activities, oil spillage, wastes carried downstream by the river, and air contaminants. In some countries, the effects of pollution are spreading from coastal waters to the open ocean.

Figure 3.2 shows areas of visible oil slicks left behind by tankers in the late 1980s.

Pollution of rivers and lakes

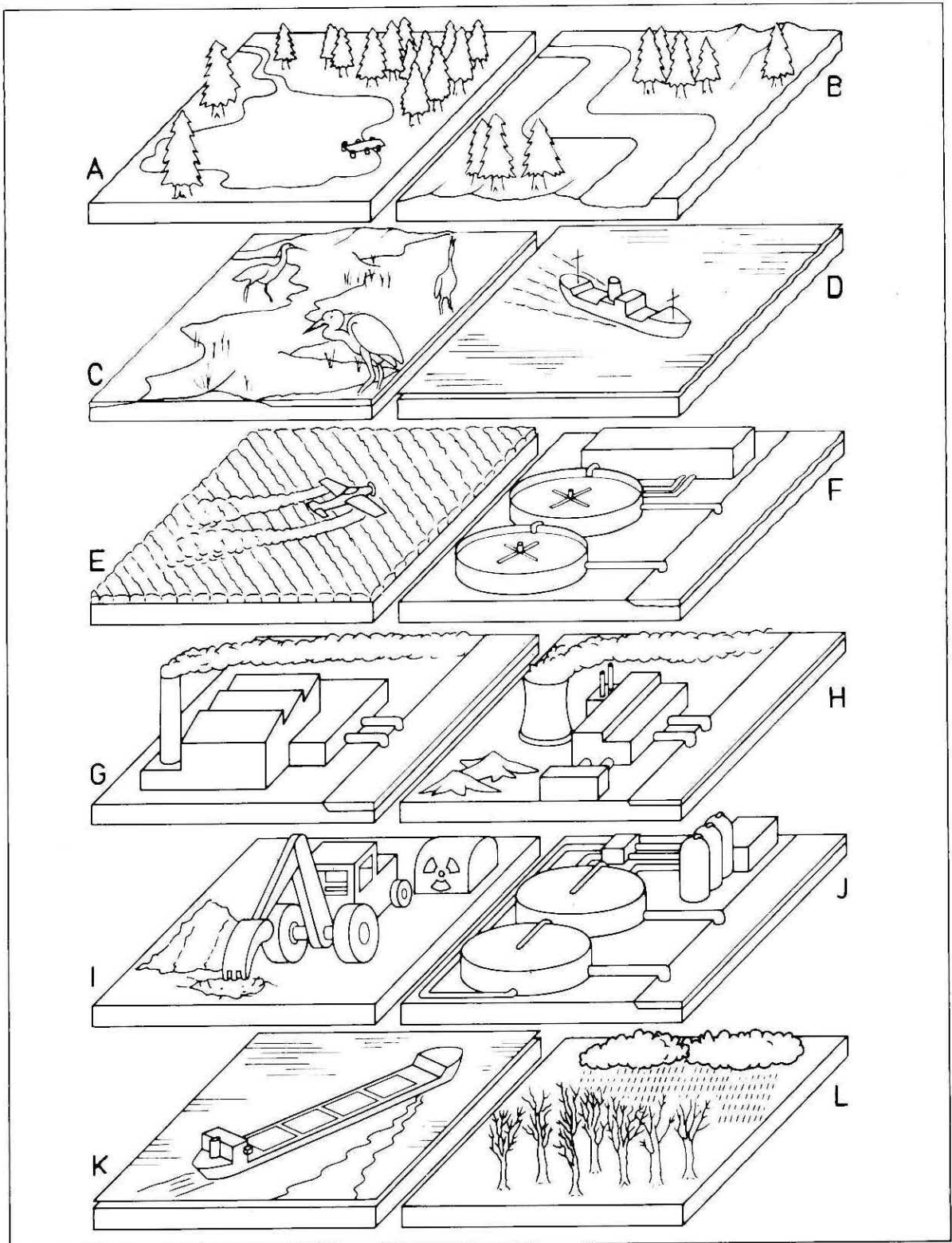
Surface waters - rivers and lakes - suffer the same problems resulting from deliberate, accidental and indirect pollution that affect the world's seas. Regardless of whether the pollution is deliberate, accidental or indirect, the effect on the surface waters and their lifeforms can be devastating (figure 3.3).

- ❑ Raw sewage reduces the oxygen (O_2) level so that most forms of life die out.
- ❑ Toxic industrial waste can destroy life but may also enter the food chain, accumulating in larger animals such as fish, birds and mammals.
- ❑ Chemical runoff from farmland enters rivers and lakes and, eventually, drinking water, seriously affecting humans. Nitrates, for example, can cause blood poisoning in babies and cancers in adults.



River pollution threatens clean water supplies

Figure 3.3: Water Pollution



A-D Areas affected

- A** Lakes
- B** Rivers
- C** Wetlands
- D** Oceans

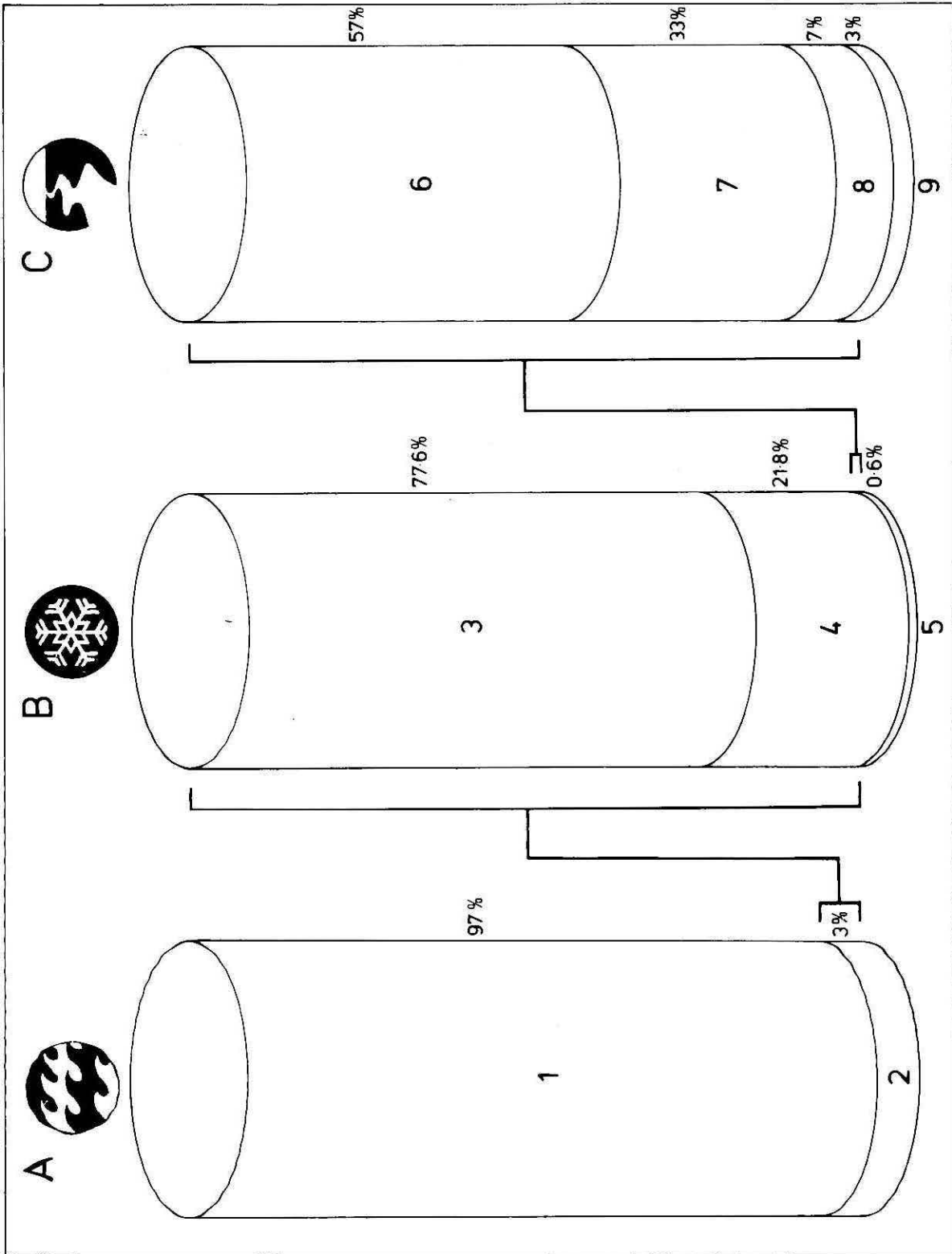
E-L Types of water pollution

- E** Pesticides and fertilizer in runoff
- F** Sewage and toxic chemicals
- G** Industrial effluent
- H** Heat pollution from power stations

I Radioactive waste

- from nuclear reactors
- J** Oil loss and seepage from refineries
- K** Deliberate and accidental oil spills; toxic waste dumping
- L** Acidification of lakes and rivers by acid rain

Figure 3.4: The World's Water



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- A** All water
- 1** Sea water
- 2** Fresh water
- B** Fresh water
- 3** Snow and ice
- 4** Groundwater
- 5** Available surface water
- C** Available surface water
- 6** Rivers and lakes
- 7** Soil moisture
- 8** Atmospheric moisture
- 9** Biological water

Pollution of marine life

The world's oceans are highly productive. Vast quantities of fish and other marine life are harvested from the seas each year, providing a vital source of protein for billions of people. But as world population increases so does the demand for fish, creating a number of problems:

- ❑ Many fisheries are now overfished, causing a decline in catches and threatening some fish species with local extinction.
- ❑ The annual world fish catch is now more than the 100 million tonnes that the United Nations Food and Agricultural Organisation (FAO) estimates to be the upper limit for a sustainable yield - and it is increasing by a million tonnes each year.
- ❑ Coastal waters, where the vast majority of marine life is found, are becoming increasingly polluted, threatening fish stocks.
- ❑ Modern fishing technology, such as the use of long drift or gill nets, needlessly kills other species, including dolphins and seals.

THE WORLD'S WATER SOURCES

One of the major sources of freshwater that is trapped by the Earth's surface and then used by man is rainwater. This is described in verse 17 of Surah ar-Ra'ad of the Holy Quran:

He sends down rainwater from the skies, and the channels flow, each according to its measure.

Based on figure 3.4 (A - the total amount of water in the world, B - the amount of fresh water, C - available surface water), we find that the amount of freshwater is only 3 %, as compared to sea water which makes up the other 97 % of the world's total water. From the 3 %, only 0.6 % is available surface water. The rest is in the form of snow, ice or trapped underground. Man has



River polluted with rubbish

to share with other living organisms, this small amount of water for his daily use. Therefore, it is the responsibility of each one of us to use water wisely.

Freshwater is not available throughout the world. About 3 % of the available surface water is limited to certain regions of the Earth. Figure 3.5 shows the world's distribution of freshwater. Regions with a surplus of water are generally located in the tropics and the poles. However, in the poles, water exists mostly as ice. The ice needs to be thawed before it can be consumed. In the tropics, water that falls as rain quickly seeps into the soil, or collects as surface waters in lakes and rivers.



Water is a basic need of man

USES OF WATER

Water is used in numerous human activities, such as for domestic, industrial and agricultural purposes. The use of water varies from country to country, depending on the status of that particular country. If the country is an industrialised country, then water is mostly used in the industrial sector. For an agricultural-based country, most of the water will be used for agriculture. Water is extremely important for human life, and is used in every aspect of human endeavours, such as agriculture, industry, for drinking and others. The Quran touches on the importance of water in human life, through verses 10-11 of Surah an-Nahl:

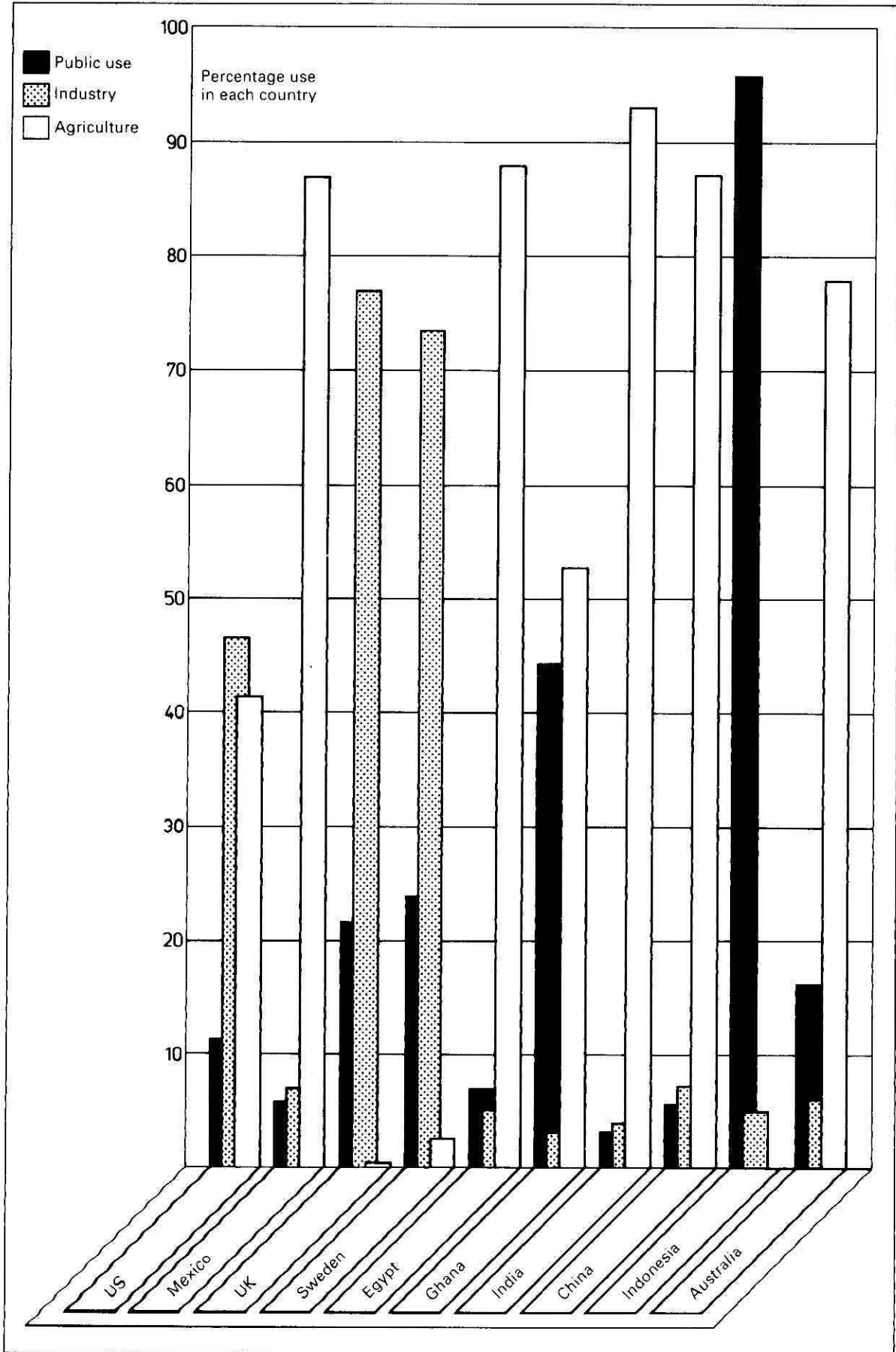
It is He who sends down rain from the sky; from it you drink, and out of it grows the vegetation on which you feed your cattle. With it He produces for you corn, olives, date palms, grapes, and every kind of fruit; verily in this is a sign for those who give thought.

Figure 3.6 shows water usage in several countries. For example, India uses more water for agriculture than the United Kingdom. Sweden uses more water for the industry, as compared to Ghana. The use of water by each country also depends on its own water resources. For example, Indonesia and India are two very populous countries in the world. However, Indonesia has enough water as it is located in the tropics where rainfall is abundant. Therefore, the amount of water for public use in Indonesia is far more than that of India.

Figure 3.5: Water Surplus And Deficiency



Figure 3.6: Uses of Water



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UNDERGROUND WATER SUPPLY

Rain that falls on the Earth's surface is a huge blessing to man. Not only does it provide drinking water but also irrigate plantations and make the land fertile. This is clearly described in verse 65 of Surah an-Nahl of the Holy Quran:

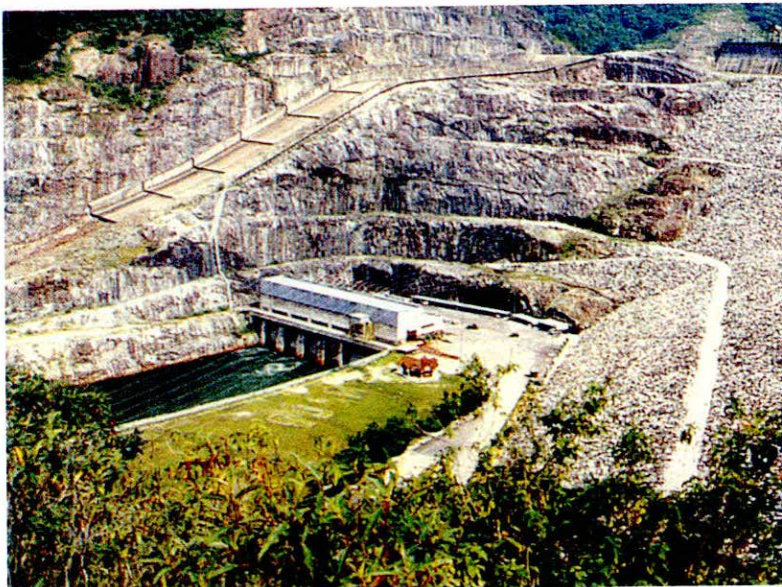
And Allah sends down rain from the skies, and gives therewith life to the earth after its death; verily in this is a sign for those who listen.

In tropical countries that receive huge amount of rainfall such as Malaysia, besides lakes and rivers, groundwater is also a major source of freshwater. Rainwater that seeps into the ground will be stored in underground rock. The dividing line between saturated and unsaturated rock is the water table. The stored water is known as groundwater. It is estimated that 40 to 60 million km³ of water is stored underground. However, only 40,000 km³ is readily accessible and rechargeable.

Each year the water table level drops by 1 metre. For example, the Ogallala aquifer in the United States of America is the world's largest store of groundwater, and is able to provide enough water to the majority of people living in the surrounding areas. Its water is removed 10,000 times faster than it is replenished.

In many countries, the primary reason for water shortage is the high rate of population growth, especially in the major cities. In cities and places with high population density, the water demand for drinking, agriculture and industry is increasing. However, the supply is limited. Therefore, the people of these countries suffer from lack of freshwater. This problem is usually faced by under-developed and developing countries.

The water shortage problem is worsened by the declining water quality. For example, pesticides and herbicides used in agriculture soak into soil and groundwater, and eventually into drinking water. Apart from agricultural activities, uncontrolled mining can also affect the quality of groundwater. Chemical spillage from mining and drilling activities will seep into groundwater and contaminate it.



of groundwater. Chemical spillage from mining and drilling activities will seep into groundwater and contaminate it.

Dams help to collect water

THE SOLUTION

Water use

As demand for freshwater increases, new resources must be exploited and wastage reduced in several ways:

- ❑ Capture water flowing off the land after heavy rainfall using small dams. Large dams tend to create many problems, like destroying eco-systems, requiring major land acquisition, displacing people, and causing silting up, thus greatly enhancing environmental hazards.
- ❑ Use groundwater sources sustainably to prevent their drying up.
- ❑ Find cheaper ways to carry out desalination to remove salt from sea water.
- ❑ Treat industrial wastewater, especially by recycling on-site.
- ❑ Ban dumping of toxic waste in sites that could lead into water supplies.
- ❑ Impose heavier fines on those who flout the laws against polluting the water.
- ❑ Implement long-term integrated management strategies to clean up waterways and prevent their initial pollution.

Ocean pollution

Although the sea is increasingly being contaminated with numerous pollutants, it remains an important source of food for man. Apart from this, the sea is also used for transportation and as a source of ornaments for humans. This is described in verse 14 of Surah an-Nahl of the Holy Quran:

It is He Who has made the sea His subject, that you may eat thereof flesh that is fresh and tender, and that you may extract therefrom ornaments to wear, and you see the ships therein that ploughs the waves, that you may seek thus the bounty of Allah and that you may be grateful.

Most nations are realising that the oceans are not bottomless pits for dumping waste, and thanks to this, ocean pollution is on the decrease. The various steps taken to reduce ocean pollution are:

- ❑ The London Dumping Convention came into force in 1975 and controls the dumping of waste from ships and aircraft.
- ❑ Ten years later, in 1985, the convention was strengthened to ban the dumping of nuclear waste at sea.
- ❑ European countries which border the North Sea have agreed to stop all dumping and incineration of harmful wastes at sea.

Lake and river pollution

Rivers and lakes are the main source of freshwater for humans. Apart from providing drinking water, rivers and lakes can also be used to tap hydro-energy through the building of dams. This is stated in verse 32 of Surah Ibrahim of the Holy Quran:

And the rivers also, He has made subject to you.

For many countries, rivers and lakes are the primary sources of freshwater. Therefore these points should be emphasised:

- ❑ Sewage must be properly treated before it is released into rivers and lakes.
- ❑ Stringent enforcement efforts must be taken and stiff penalties imposed on industrial polluters of rivers and lakes.
- ❑ To enact laws which oblige the industry to recycle water or treat the waste before releasing it into rivers and lakes.

CONCLUSION

Without doubt, freshwater is vital for human life. Although there appears to be a lot of water around us, only a small percentage of it can be used by man. Statistics show that the amount of water on the surface of the Earth is about 1.4 billion km³, 97.2 % of which is salt water, while another 2.2 % exists in the form of ice in the North and South Poles. Therefore, only 0.6 % of water is available on land, such as in rivers and lakes, and underground.

Based on the statistics, the quantity of water that can be used is 31,000 litres per day per capita of world's population. Even though this figure looks large, but actually less than 10 per cent of the total amount is for domestic use. Most of the water is used in irrigation, agriculture, industry and others. Any action on the part of man that can affect water quality and disregard the needs of future generations is definitely unwise. The total amount of world's fresh and quality water is decreasing, while the demand for it is increasing. Therefore the responsibility to improve water quality lies with the consumers.

Freshwater is an essential resource for human life. This is stated in verse 99 of Surah al-An'am of the Holy Quran:

It is He who sends down rain from the skies, with it We produce vegetation of all kinds; from some We produce green crops, out of which We produce grain, heaped up at harvest; out of the date-palm and its sheaths or spathes come clusters of dates hanging low and near: and then there are gardens of grapes, and olives, and pomegranates, each similar in kind yet different in variety; when they begin to bear fruit, feast your eyes with the fruit and the ripeness there of. Behold! In these things there are signs for people who believe.

AIR

BY
ABU BAKAR YANG

Among His signs is this, that He sends the winds as heralds of glad tidings, giving you a taste of His grace and mercy, that the ships may sail majestically by His command and that you may seek of His bounty; in order that you may be grateful.

Surah Ar-Ruum: verse 46

Air denotes a mixture of gases found in the Earth's atmosphere. The main components of air are:

Nitrogen	-	78.08 %
Oxygen	-	20.95 %
Argon	-	0.934 %
Carbon dioxide	-	0.0314 %
Other gases	-	at a very low concentration



The amount of these gases constantly varies within a limited range. The components that change over the widest range are water vapour (H_2O) and carbon dioxide (CO_2). The total water vapour content of air may vary between less than 1% to 5 or 6 %. The concentration of CO_2 is normally maintained at 0.03%.

However, the percentage of CO_2 may rise when there are activities that release a lot of the gas, such as the decaying of plants and the burning of fuel, or when too many people are packed into a small room. A lower level of carbon dioxide is found in areas full of plants and trees, such as forests and plantations, or in the cool breeze which blows over the surface of the ocean.

Clean air is vital for human life. However, clean air is not easy to find. This is because sulphur dioxide (SO_2), hydrogen sulphide (H_2S) and carbon monoxide (CO) are continuously released into the atmosphere through activities such as volcano eruptions, decomposition of plants, and the burning of fuels and forests. In addition, fine particles (solid or liquid) are constantly blown by strong winds from one place to another.

Figure 4.1 shows the structure of the Earth's atmosphere.

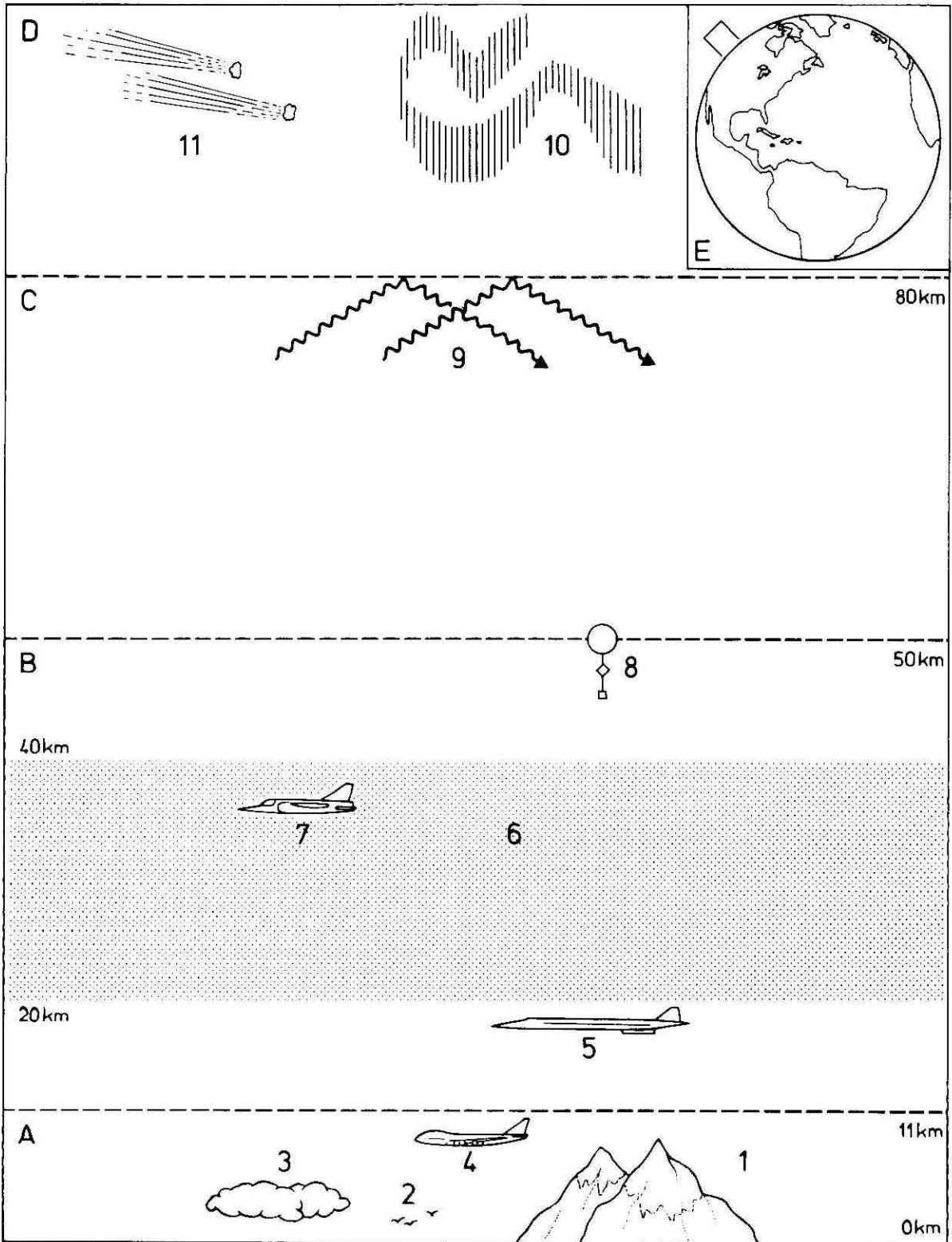
AIR POLLUTION

Clean air is a precious gift from God to man. However, the supply of clean air is limited. Although we do not have to pay for air, there is no reason why we should pollute it. Air pollution happens when a substance or a group of substances released into the atmosphere endangers or affects man, animals, plants and other organisms.



Open burning is a major cause of air pollution

Figure 4.1: Structure of The Atmosphere



- | | | |
|--|--|---------------------------|
| A Troposphere | 1 Mount Everest (9km) | 10 Aurora borealis |
| B Stratosphere | 2 Birds | 11 Meteorites |
| C Mesosphere | 3 Clouds | |
| D Ionosphere | 4 Jumbo jet | |
| The ionosphere extends into space to about 650km | 5 Concorde | |
| E Atmosphere relative to Earth | 6 Ozone layer | |
| | 7 High-altitude military aircraft | |
| | 8 Weather balloon | |
| | 9 Radio waves reflected | |

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Islam provides a general guideline on air pollution. For example, Prophet Muhammad (peace be upon him) refrained those with bad breath from going to the mosque, as this would disturb other people who were performing religious deeds. Jabir ibn Abdullah reported that the Prophet said, “Those who have just consumed garlic or onion should refrain from standing close to me or visiting the mosque”.

This advice clearly indicates that pollution, however small, that causes public discomfort, should be avoided. What more if the pollution can threaten public safety, such as that due to poisonous gases, toxic materials and others.

SOURCES AND TYPES OF POLLUTION

There are two types of polluting substances or contaminants.

Primary contaminants

These are contaminants that are produced directly from identified sources. The sources of primary contaminants can be divided into three groups.

- a. Natural sources.
- b. Sources due to human activities.
- c. Natural sources, but due to human activities.

Secondary contaminants

These are contaminants produced from the interactions of two or more primary contaminants, or the reaction between the primary contaminants and the components of the atmosphere, whether resulting in photochemical effects or not.



Air pollution reduces visibility and light

NATURAL CONTAMINANTS

- The force of ocean waves hitting the coastline. The contaminants are basically salt water and vapour. However, the sea is important to the environment. It can affect the climate by forming clouds and mists.
- Sandstorm - this usually happens in open and dried areas, such as tropical deserts, when there is a strong wind blowing.

- ❑ Pollen grains - these are carried by the wind.
- ❑ Bacteria and viruses - also affect air cleanliness, however the effect is negligible.

CONTAMINANTS DUE TO HUMAN ACTIVITIES

Burning is the primary factor that causes air pollution. It usually gives rise to two types of contaminants.

Particulates

Particulates include contaminants such as ashes and soot. Ashes can be from organic and inorganic compounds. Soot is fine carbon powder found in smoke. These contaminants affect visibility, reduce the amount of sunlight reaching Earth's surface, and blacken buildings, clothing, plants and even humans themselves.



Kuala Lumpur during the haze of 1997

Gas

The release of gases such as SO_2 , CO , CO_2 , hydrocarbon (HC), and oxides of nitrogen (NO_x) to the atmosphere, also causes air pollution. These gases are wrongly regarded as 'status symbols'. They are associated with pollution in countries using sophisticated technology and having a lot of cars.

EFFECTS OF AIR POLLUTION

Effects on health

Air pollution is dangerous to health. For example, air pollution affects the human respiratory system. Air contaminants enter our body through the nose or mouth, and then move on to the lungs via the trachea. In the lungs, air is passed onto the bronchi and then, alveoli. Alveoli are very small air sacs that allow gases to be exchanged. Contaminants are either absorbed into the blood or removed from the lungs by the cilia in the bronchi. Cilia are little brushes that sweep contaminants up to the throat and into the alimentary canal. Cilia may be destroyed due to the contaminated air that we breathe. Fine particulate contaminants that can pass the cilia are known as 'inspired particles'. Among the air contaminants that can threaten health is CO .

The effect of CO on human health is directly proportional to the quantity of the gas bound to the haemoglobin. Oxygen is carried in the blood in the form of oxyhaemoglobin (HbO_2). Oxyhaemoglobin is a partially stable compound where O_2 is weakly bonded to the ferrous ion (Fe^{2+}) in the haemoglobin of the red blood cells. Oxygen is then taken up by cellular respiration

and the haemoglobin is once again free to carry new oxygen molecules. If CO were present, it would reduce the ability of haemoglobin to carry oxygen in the blood. Carbon monoxide readily combines with haemoglobin to form carboxylhaemoglobin (HbCO) which is far more stable. Haemoglobin in the form of carboxylhaemoglobin cannot be released to carry oxygen molecules required by cells and tissues. Therefore, CO is one of the most effective pollutants that can poison the O₂ transport system.

There are also other types of pollutants that can endanger human health. For example, nitrogen dioxide (NO₂) can cause oedema and pulmonary bleeding or haemorrhage. Oedema is the abnormal accumulation of fluid in body tissue. Therefore, pulmonary oedema is the accumulation of excessive fluid in the lungs. Another pollutant is the ozone gas (O₃), which is an oxidising gas that can cause irritation. A concentration of ozone in the range of a few parts per million (ppm) is enough to trigger pulmonary obstruction, oedema and haemorrhage.

Effects on plants

Plants are also affected by air pollution. Air contaminants can destroy plants in three ways:

- a. Necrosis - leaf tissue is destroyed
- b. Chlorosis - leaf loses or changes colour
- c. Disrupt plant growth

For example, SO₂ produces little spots in between the veins of the leaf. Alfalfa, barley, cotton, wheat and apple are some of the trees sensitive to SO₂. Ozone can also spoil plants. Tomato, tobacco, beans, spinach and potato are examples of plants sensitive to ozone.

Effects on livestock

Air contaminants affect not only human but also livestock. For example, in 1950 in Poza Rica, Mexico, SO₂ released into the air from a refinery caused animal feed to be contaminated. A great number of canaries, chickens, ducks, cattle, pigs, swans and dogs died after eating animal feed exposed to the toxic gas.

Lead (Pb) is yet another contaminant that can poison and kill livestock. For example, some years ago in Germany, Pb dust released from a lead and zinc-processing factory killed cattle and horses grazing on grasslands within a 5-km radius of the factory.

Effects on materials

The main effect of air pollution is to stain the surface of materials, for example, buildings and clothing. The stain is due to the sedimentation of smoke and fine particles with a diameter of about 0.3 micrometer. After a while, the sediment is visible to the eye. We then say that the surface is dirty, stained or darkened.

Air pollution also affects the rate of metal erosion. The presence of SO_2 in the air can increase the rate of metal erosion. Fabrics are also affected by air contaminants. For example, a few years ago, women in several cities of Canada and Florida, found their nylon stockings easily decomposed. This was due to the fine sulphuric acid droplets that polluted the air of these cities.

Effects on the atmosphere

One of the effects of air pollution on the environment is poor visibility. A good example of this was the Indonesian forest fire in 1997 that resulted in severe haze in several Southeast Asian countries, including Malaysia. Apart from this, the rise in CO_2 content of the atmosphere has increased Earth's surface temperature. Scientists have debated extensively on this issue. They believe that the concentration of CO_2 will rise, from 0.032% in 1968 to 0.038% by the year 2000. According to theory, this will raise Earth's surface temperature by 0.5°C , a phenomenon known as the greenhouse effect.



Uncontrolled forest fires worsen air quality

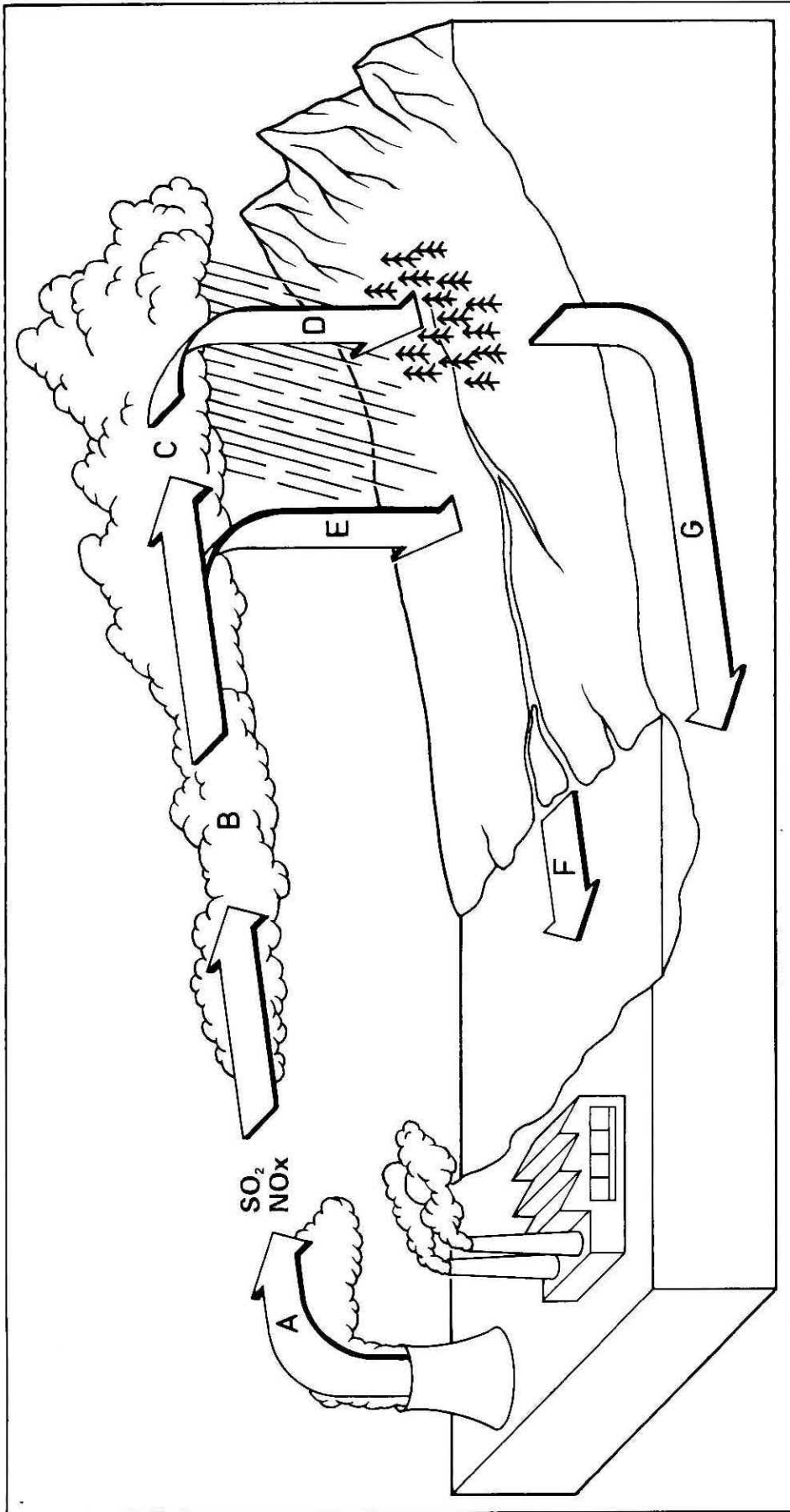
AIR, WEATHER AND CLIMATE

Until the last several decades, elements linked to weather and climate are seldom regarded as natural sources. We wrongly assume the supply of these elements as unlimited. The reality is that the air that we breathe is being polluted, and the rate of pollution is now increasing all over the world. Air pollution, global warming, the thinning and leaking of the ozone layer, acid rain, flood, landslide, hurricane and other natural disasters involving the elements of weather and climate, are threatening the flora, the fauna, the environment and humans. As a result of these, many species of the flora and the fauna have disappeared from the biosphere.

The Quran also gives an explanation on the changes in the weather and air, due to factors such as water, wind and clouds. Verse 164 of Surah al-Baqarah states:

Behold! In the creation of the heavens and the earth; in the alternation of the night and the day; in the sailing of the ships through the ocean for the profit of mankind; in the rain which Allah sends down from the skies, and the life which He gives therewith to an earth that is dead; in the beasts of all kinds that He scatters through the earth; in the change of the winds, and the clouds which they trail like their slaves between the sky and the earth - here indeed are signs for a people that are wise.

Figure 4.2: Acid Rain



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- A** Acid rain is produced by the release of sulfur dioxide (SO₂) and nitrogen oxides (NOx) into the atmosphere from factories and power stations
- B** Gases combine with water to make sulfuric and nitric acids
- C** Acidic clouds can travel for long distances from the source
- D** Acid rain and snow fall on trees, killing them
- E** Acid rain runs into river, killing fish and other organisms
- F** Acidified water runs into lake, killing fish
- G** Acidified water leaches nutrients and heavy metals out of soil. These wash into the lake, polluting it

Acid Rain

Figure 4.2 shows how acid rain is formed.

The Importance of Air, Weather and Climate to Living Organisms

The cool temperature at hill resorts, such as Fraser's Hill and Cameron Highlands, and the tropical sunshine sought after by foreign tourists, are both sources of the weather and climate. Sunlight is also important for plant growth. One other source is the white snow at winter resorts. Natural sources such as clean water, fresh air, the moist wind that brings rain, and the sunlight that allows the reproduction of flora and fauna, are all classified as sources of the air, weather and climate that are vital to Earth's living organisms.

In addition, the Quran states that one of the important roles of the wind is to act as an agent for plant reproduction. For example, the wind helps spread new plant colonies either through the pollination process or by carrying seeds to fertile land. This is explained in verse 22 of Surah al-Hijr of the Holy Quran:

And We send the fertile winds, then cause the rain to descend from the sky, therewith providing you with water in abundance, though you are not the guardians of its stores.

In general, natural sources can be regarded as either enclosed or flowing.

NATURAL SOURCES

Enclosed sources

- Forest
- Fresh water
- Clean Air
- Minerals
- Fossil fuels
- Land
- Flora and fauna

Flowing sources

- Air
- Water
- Atmosphere
- Elements of the weather
- Salt water
- Gas
- Sunlight

Man, Climate and Weather

Elements of the weather and climate can be divided into two groups, that is 'positive' elements and 'negative' elements. The positive elements of the weather and climate are known as 'natural sources', while the negative elements are referred to as 'natural disasters'. The interactions between man and the Earth's atmosphere, especially those involving the weather and climate have given rise to more natural disasters than natural sources. For example, the dense population, industrialisation and a high number of vehicles in the city have caused air pollution, resulting in a change in the elements of the weather and climate.

Apart from this, positive elements at a certain place and time may change to become negative elements at a new place and time. For example, heavy rain in the desert is very important but if this happens in a wet region during the monsoon season, then it may cause flooding, and is therefore termed a natural disaster.

Man, regardless of whether he lives in the city or village, is always interacting with nature to produce natural disasters such as contaminated air, haze, acid rain and global warming. Therefore, statements claiming that flooding, landslide and other disasters as natural phenomena are not true. This is because none of these so-called natural disasters is truly natural. The human element is present in every disaster.

Therefore, man must use the elements of the weather and climate wisely. This will reduce or prevent the dangers that they may pose. Unfortunately, the drive towards economic development and prosperity especially in the quest to become fully developed, has resulted in many developing nations ignoring the conservation of the environment. The environment, especially the elements of the air, weather and climate, is sacrificed for the sake of progress, development and economic prosperity. However, this does not mean that all development efforts have to be stopped. This will decrease the standard of living of the world's population. What is more important is to practise a balanced development, which emphasises on the conservation of the environment while at the same time provides benefits to mankind.



Uncertain weather conditions during the monsoon can cause natural disasters

CONCLUSION

The awareness among humans on the conservation of the environment, which includes care for its elements such as the air, weather and climate, is very important. This will create the feeling of love for the environment and the realisation of how fragile the natural system can be when left in the hands of man. Man must work extremely hard to protect and conserve the natural condition of the atmosphere and all the elements within it.

Islam demands that we should always take good care of the environment. Man is urged to ponder on the creation of the world, and to be wary of disasters that may happen in the future. Verse 57 of Surah al-A'raf of the Holy Quran states:

It is He Who sends the winds like heralds of glad tidings, going before His Mercy: when they have carried the heavy-laden clouds, We drive them to a land that is dead, make rain to descend thereon, and produce every kind of harvest therewith: thus shall We raise up the dead: perhaps you may remember.

In addition, countries must work together in the effort to reduce the impact of human activities on the world's atmosphere. All quarters, from the individual to the local, national and global levels have to play their roles to ensure that the world's atmospheric system will not be destroyed in the future. The atmosphere and its whole content must be regarded as vital components to be conserved in all development projects.

LAND

BY
ABU BAKAR YANG

From the Earth did We create you, and into it shall We return you, and from it shall We bring you out once again.

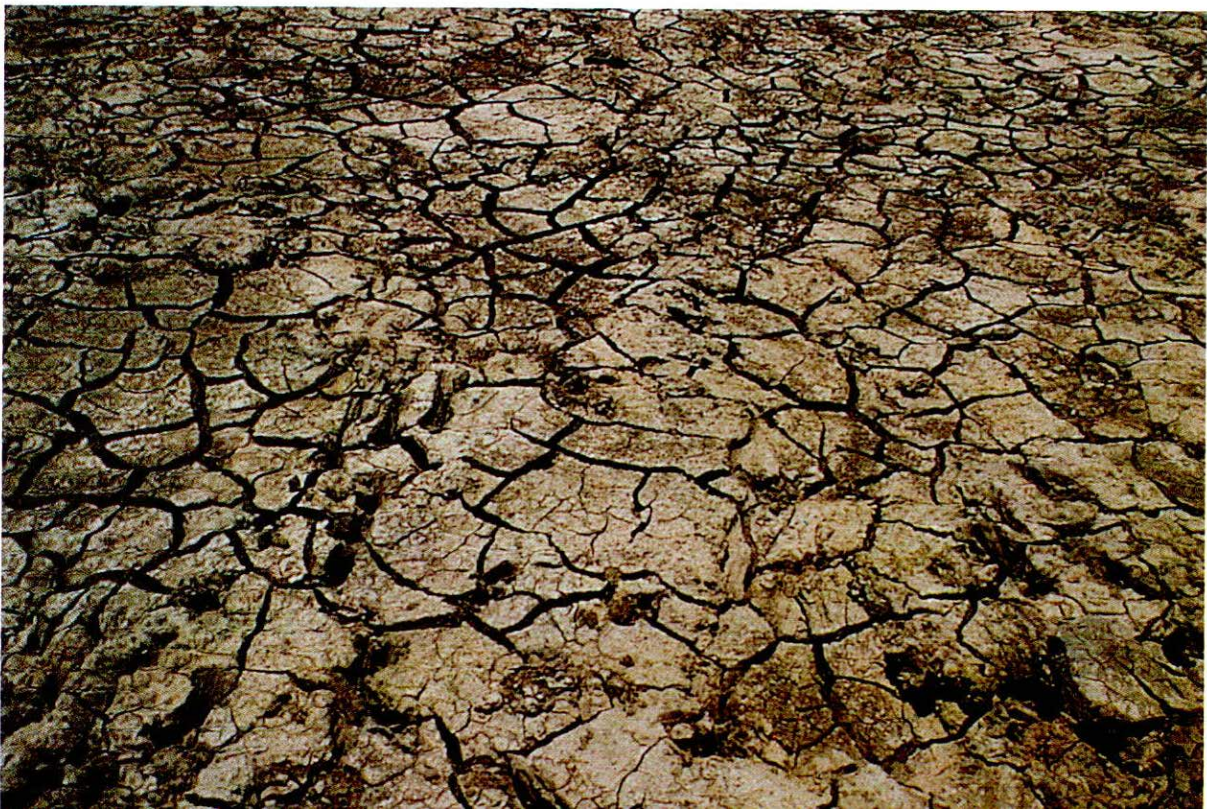
Surah Ta-ha: verse 55

Land is one of the most precious natural resources. On land, man and many other organisms go about doing their daily activities. Land provides an important support for all types of living organisms in this world. One cannot imagine what would happen if there is no land at all! Since ancient times, man has depended on the land for shelter and cultivation, so that he can make a living.

It is stated in the Holy Quran that land is the home of man.

Yes, God has made for you the earth like a carpet spread out, and has made for you roads and channels therein, in order that you may find guidance on the way.

Surah az-Zukhruf: verse 10



However, man's greed and selfishness in exploiting the land has damaged this important natural resource. For the past 10,000 years, since the time of the earliest agriculturists, man has altered their surroundings. In the 20th century, however, a rapid and unprecedented transformation of the Earth's surface has occurred. Unfortunately, the dramatic changes caused by, for example, urbanisation, road building, waste dumping, mining, deforestation, and intensive agriculture may have catastrophic effects on the Earth and its inhabitants unless carefully controlled.

Agriculture is one of the factors that alter land quality. Although agriculture is essential to feed the human population, modern agricultural techniques when improperly used, cause environmental damage in many direct and indirect ways. Intensive farming in response to the growing food requirements of an expanding population is risky. The environment may be degraded to the extent that food production will actually decrease. For example, at present 11% of the world's land area is used for growing crops. Croplands are being degraded by overcultivation, poisoned by pesticides, and turned into deserts or destroyed by roads and houses built across them. To provide new areas for croplands, land such as forests, wetlands and highlands are being explored and exploited.

LAND'S CONTRIBUTION TO MAN

It cannot be denied that land plays an important role in man's life. Many of his activities take place on land. These include agriculture, industry, communication and transportation.

Agriculture

Land has become an important and precious resource that can enhance man's quality of life. On land, plants and animals can grow, and as a result, man is guaranteed of enough food supply. However, based on figure 5.1, we see that not every country in the world has fertile land for growing productive crops. Malaysia is lucky as the country is blessed with fertile land which has high productivity. The Quran states that God the Almighty has made it possible for the various types of plants to grow on the surface of the Earth (verse 7 of Surah as-Syu'ara).

Do they not look at the Earth, how many noble things of all kinds we have produced therein?

Land productivity is measured by the amount of carbon gained by plants through photosynthesis per square metre per year. Therefore, countries in the tropics like Malaysia, which receive a lot of sunshine and rain, are categorised as having high productivity. (The numbers in figure 5.1 denote the total amount of carbon gained /m² /per year).

Resources

Apart from providing a base for plants to grow, land also contains natural resources. Examples of important resources formed underground are coal, natural gas and petroleum. There are



Man uses the land for agriculture and farming

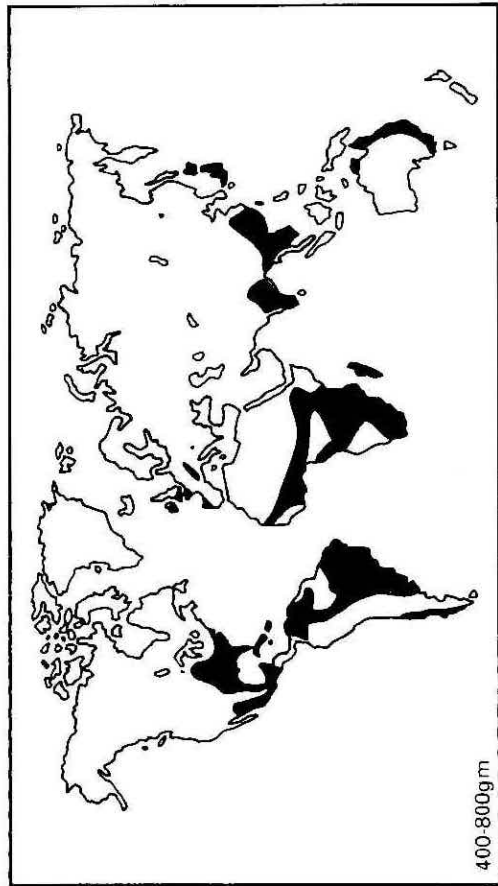
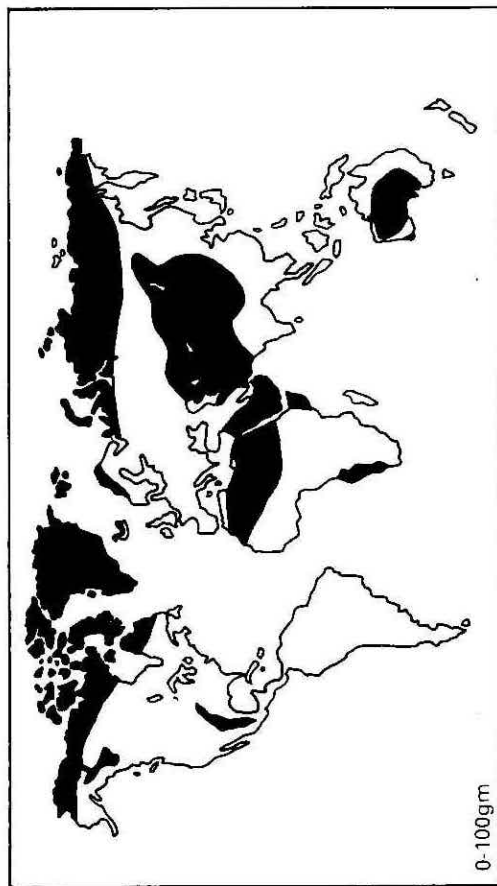
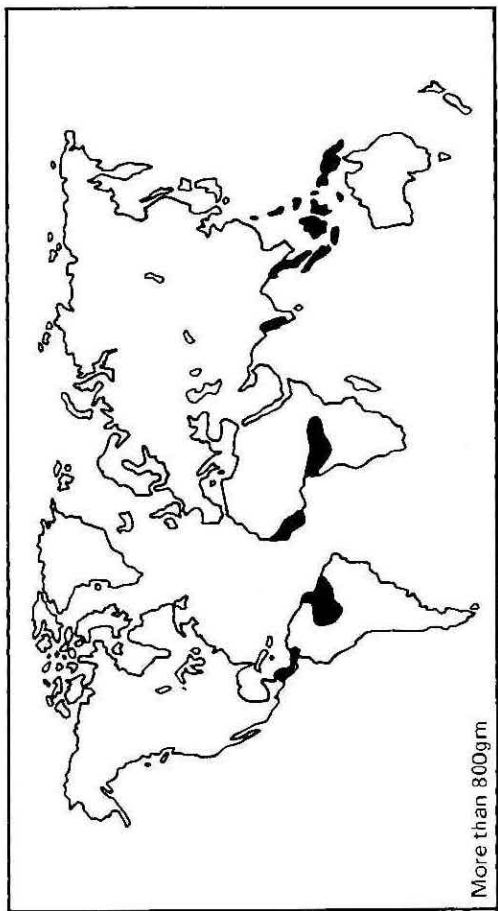
minerals, too, such as tin and gold. The Quran states the significance of minerals for human in verse 25 of Surah al-Hadid:

And We sent down iron, in which is material for mighty war, as well as many benefits for mankind.

Coal is a dark solid combustible fossil fuel. It is rich in carbon, and exists in layers in regions of sediment rock. Coal is formed through anaerobic degradation of plants in ancient swampy areas. The first stage of degradation leads to the formation of peat. After a long period of high temperature and pressure of the sediment rock, the peat changes into coal. In general coal is divided into three types, namely; lignite, bitumen and anthracite. The world's coal reserve is presently at 500 billion metric tonnes. Russia, United States of America, Germany, South Africa and Australia have a high coal reserve. Apart from directly providing heat and energy, coal is also an indirect source of coke, an important material used in the iron and steel industry.

Petroleum is the main fossil energy and raw material used by man. Petroleum is formed from the compacting of organic materials, especially the remains of marine organisms buried underneath piles of sand and clay. After millions of years, the sand and clay thicken and harden to form rocks. The pressure of the rock and the high temperature of the Earth's crust convert the organic materials into oil droplets and gas. These slowly move upward to accumulate in between the solid rocks. The world's petroleum reserve currently stands at 50 billion metric tonnes. The rate of petroleum consumption is 3 billion metric tonnes per year. Sixty percent of world's petroleum reserve is located in West Asian countries.

Figure 5.1: Land Productivity



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Land productivity is measured by the amount of carbon gained by plants through photosynthesis per sq m per year

Productivity depends on temperature and rainfall. Highest levels occur in the Equatorial regions, mainly in tropical forests

Wetlands

Another land area that is vital to man is the wetlands. The world's wetlands include swamps, mangrove swamps, marshes, estuaries and coral reefs.

Figure 5.2 describes the importance of wetlands.

- They provide habitats for thousands of plant and animal species.
- They filter out pollution from sewage and industrial sources dumped into rivers and lakes.
- They provide food and other useful materials to man, such as fish, snails and various types of wood.
- They serve as stopping points for migratory species, especially birds.
- Coastal wetlands are spawning and nursery areas for fish and shellfish.
- Coastal wetlands protect the shoreline against wave erosion.

Wetlands show very high primary production compared to the open oceans or continental shelf. Figure 5.3 shows that mangrove (A) has the highest plant productivity compared to coral reefs (B), estuary (C), salt marsh (D), continental shelf (E), and open ocean (F).

However, wetlands are constantly being threatened by human activities and pollution, such as:

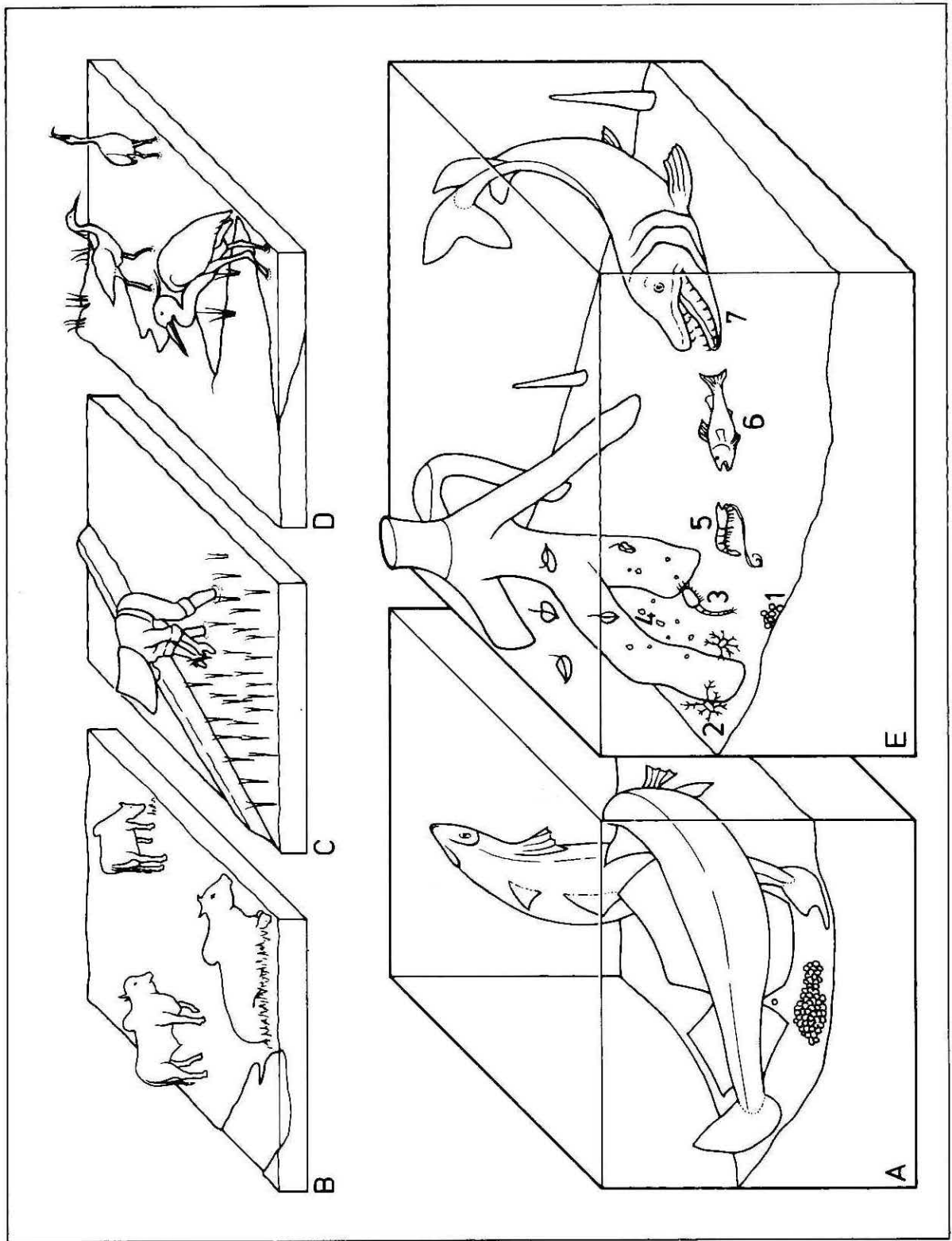
- Draining or filling to reclaim land for agriculture and building.
- Drowning following the construction of dams.
- Poisoning by industrial toxic waste and rubbish.

Coral Reefs

In addition to wetlands, there is an underwater land area that is important to man. This is an area filled with coral reefs. Although they are under seawater, coral reefs contribute significantly to man. Shaded areas in figure 5.4 show world's coral reefs (A), and coral reefs which are under threat (B). The world has an estimated 600,000 km² of coral reefs. Many of these are under threat due to human activities.

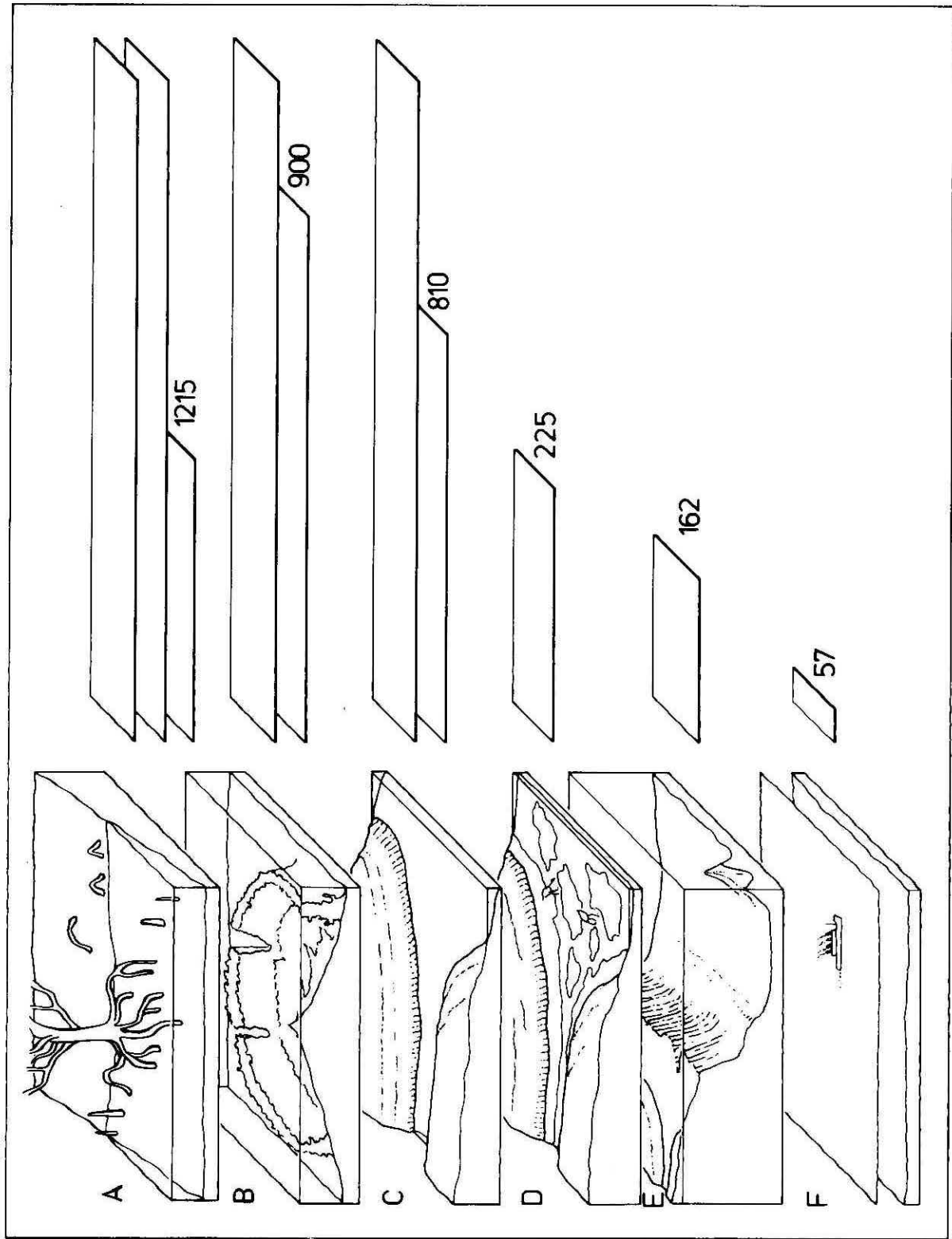
Coral reefs are rich with various species of marine organisms. In a single reef, there may be 3,000 species of corals, fish, shellfish and other marine animals. Coral reefs produce about 9 million metric tonnes of fish each year, approximately 12% of world's catch. They also offer potential for new medicines. For example, didemnin obtained from sea squirt is used to fight certain viruses.

Figure 5.2: Importance of Wetlands



A Spawning grounds and nurseries for fish and other economically important species
B Floodplains form rich pasture for cattle
C Food production, eg paddy fields
D Stopovers and feeding grounds for birds
E Feeding areas for aquaculture, eg mangroves
1 Shrimp eggs hatch
2,3 Growing shrimps feed on nutrients from decaying mangrove vegetation (4)
5 Adult shrimp eaten by small fish (6)
6 Small fish eaten by large fish (7)

Figure 5.3: Wetland Productivity



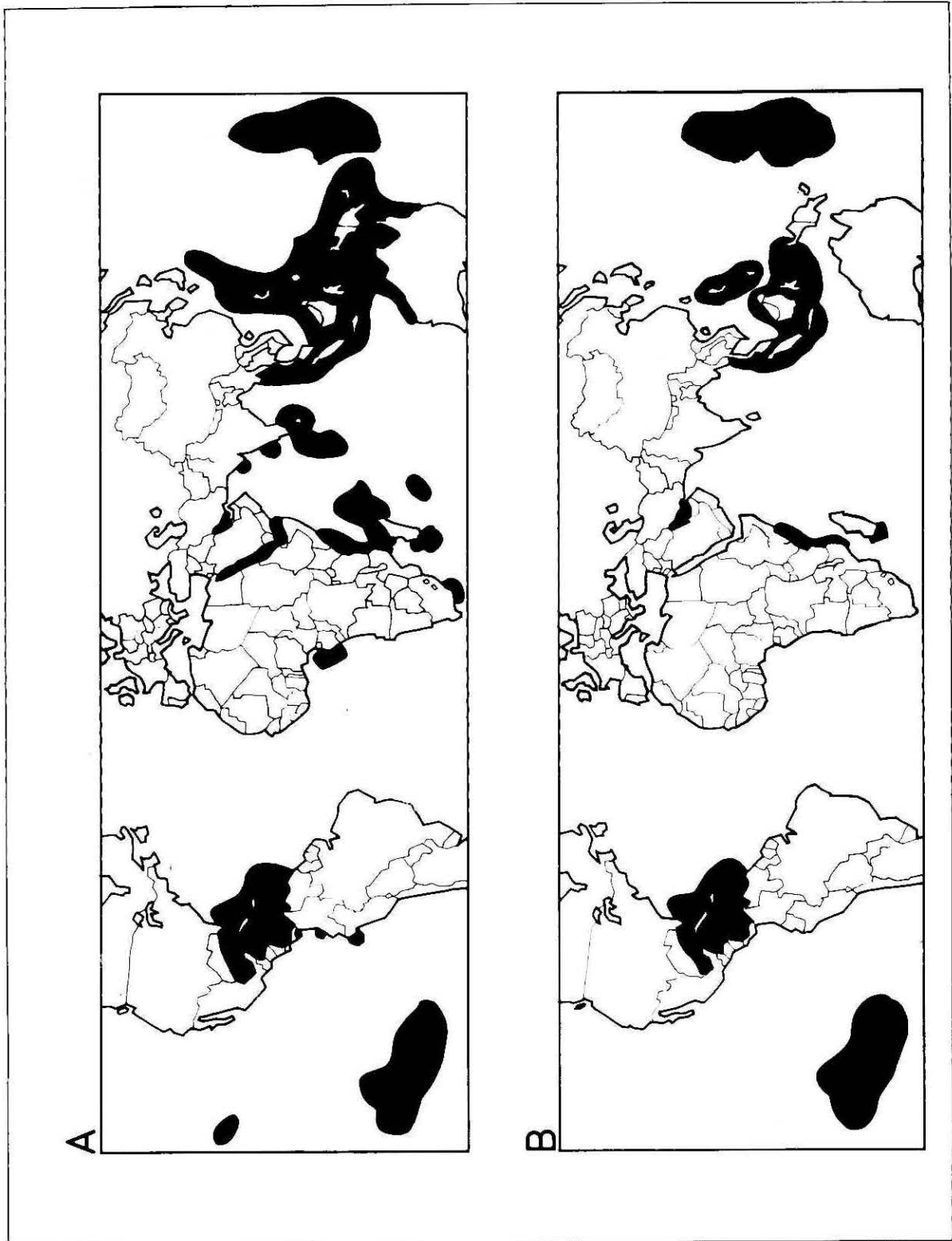
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Net primary production (g/m² carbon per cubic m per year)

Wetlands show very high primary production compared to the open oceans or continental shelf. This high plant productivity is directly threatened by pollution and other environmental degradation

- A Mangrove
- B Coral reef
- C Estuary
- D Salt marsh
- E Continental shelf
- F Open ocean

Figure 5.4: Coral Reefs Under Threat



A World's coral reefs
B Coral reefs under threat

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Coral reefs offer some of the most breathtaking natural scenery. Australia, a country rich in coral reefs such as the Great Barrier Reefs, often attracts tourists. Apart from their unique beauty, coral reefs calm wave energy and protect shorelines. They also control levels of minerals in runoff to ocean.

Nevertheless, coral reefs are constantly under threat. Figure 5.5 shows some of the factors that pollute and threaten the safety and beauty of world's coral reefs.

EFFECTS OF HUMAN ACTIVITIES ON LAND

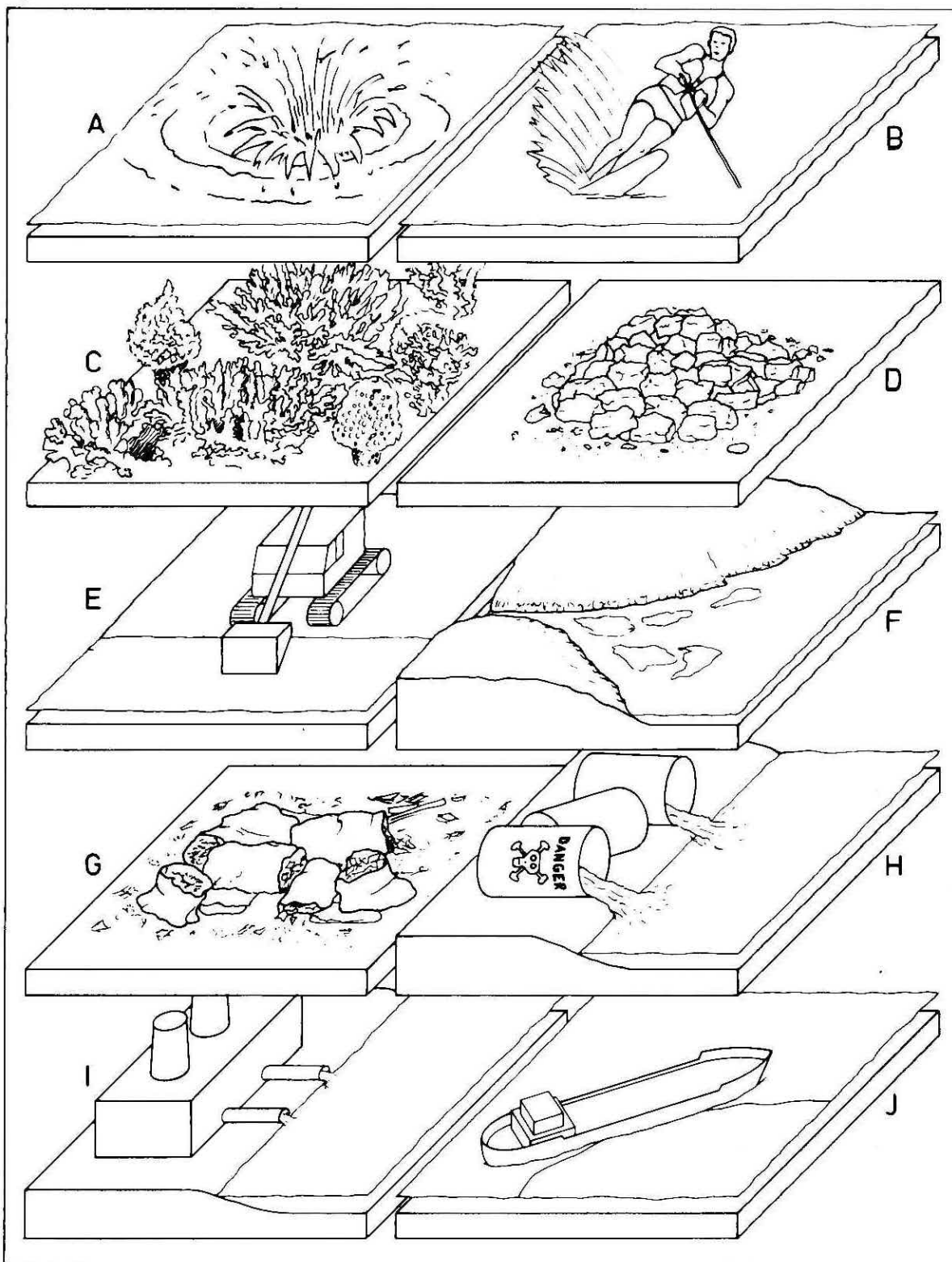
Most land loses its quality due to indiscriminate human activities. Figure 5.6 shows how human activities directly affect land.

- A. The dumping of garbage, and nuclear and toxic wastes will pollute the land and make it unsuitable for living. An obvious example is the explosion at the nuclear plant in Chernobyl, Russia on 26th April 1986. The effect was felt in Sweden. A few months after the incident, 23 people were reported dead due to nuclear radiation. The whole population of Chernobyl and its surrounding area were evacuated. In many areas, the sale of meat was prohibited as the radiation level was too high and detrimental to health.
- B. Industrial wastes also destroy land and reduce its quality.
- C. Accidental spillage from road transport affects the quality of land.



Erosion decreases the quality of land

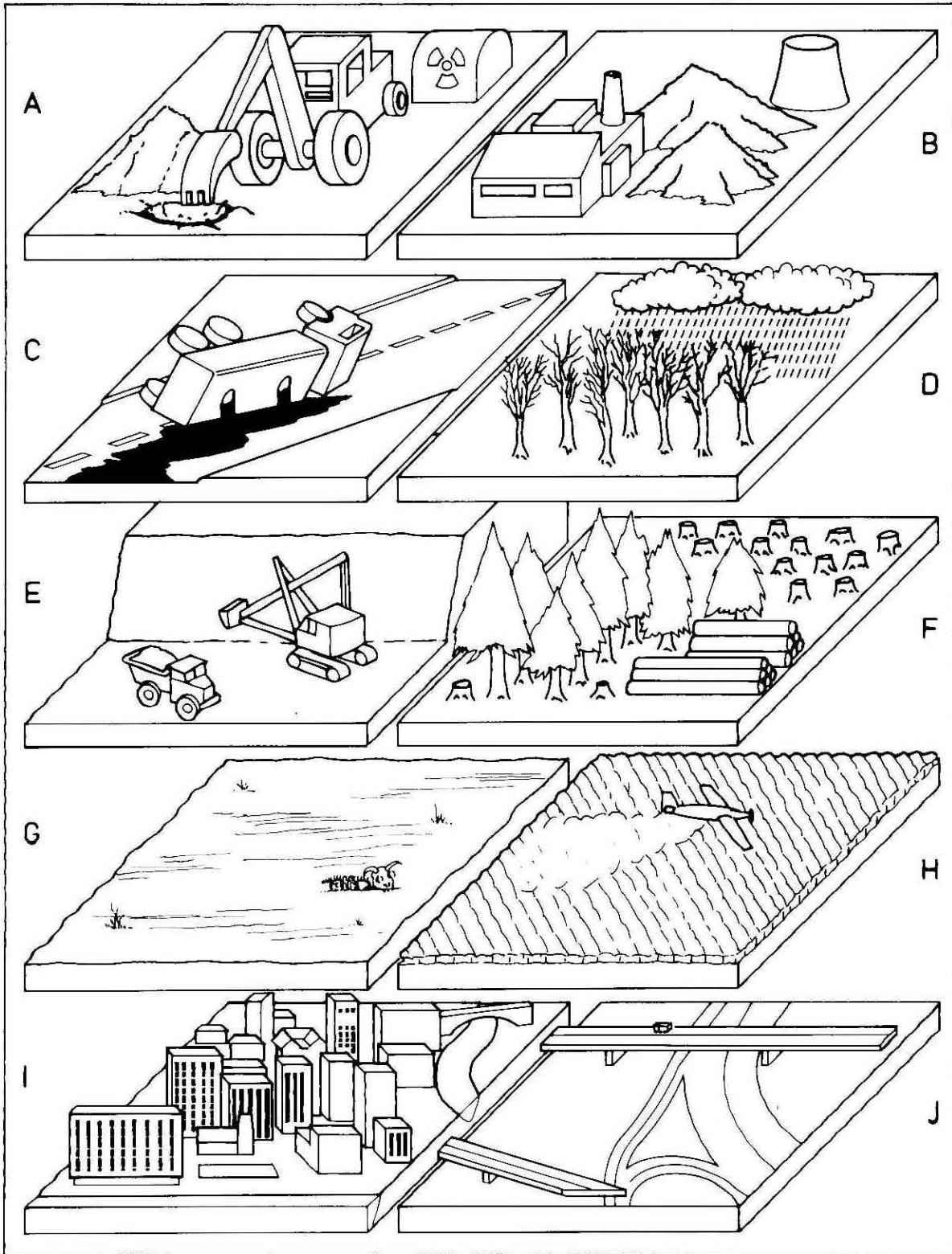
Figure 5.5: Threats to Coral Reefs



- | | |
|--|---|
| A Overfishing and dynamite fishing | F Silting as a result of deforestation |
| B Pressures from tourism | G Dumping of domestic waste |
| C Collecting ornamental coral | H Chemical pollution |
| D Mining for building materials | I Nuclear pollution |
| E Dredging reefs for land reclamation | J Oil spills |

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Figure 5.6: Effects of Human Activity On Land



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- | | | |
|--|--|---|
| A Dumping garbage, nuclear and toxic waste | E Mining coal and minerals | H Pesticide accumulation in the soil |
| B Industrial wastes accumulating on land | F Deforestation of temperate and tropical forests | I Urbanization |
| C Accidental spillages from road transport | G Overgrazing and overcultivation of croplands leading to desertification | J Road building |
| D Acid rain and particulate waste falling on land | | |

- D. Acid rain, due to the release of toxic gases to the atmosphere by industries, when falls onto the land will seep into the ground.
- E. Excessive and uncontrolled mining causes land damage such as erosion.
- F. Erosion is also due to deforestation or uncontrolled logging.
- G. Overgrazing and overcultivation of croplands can lead to desertification.
- H. The use of pesticides and herbicides contribute to reducing the quality of land.
- I. Erratic development and urbanisation also cause land pollution.
- J. Progress in the transport industry has led to many land areas being used to build roads, railway tracks and airports.

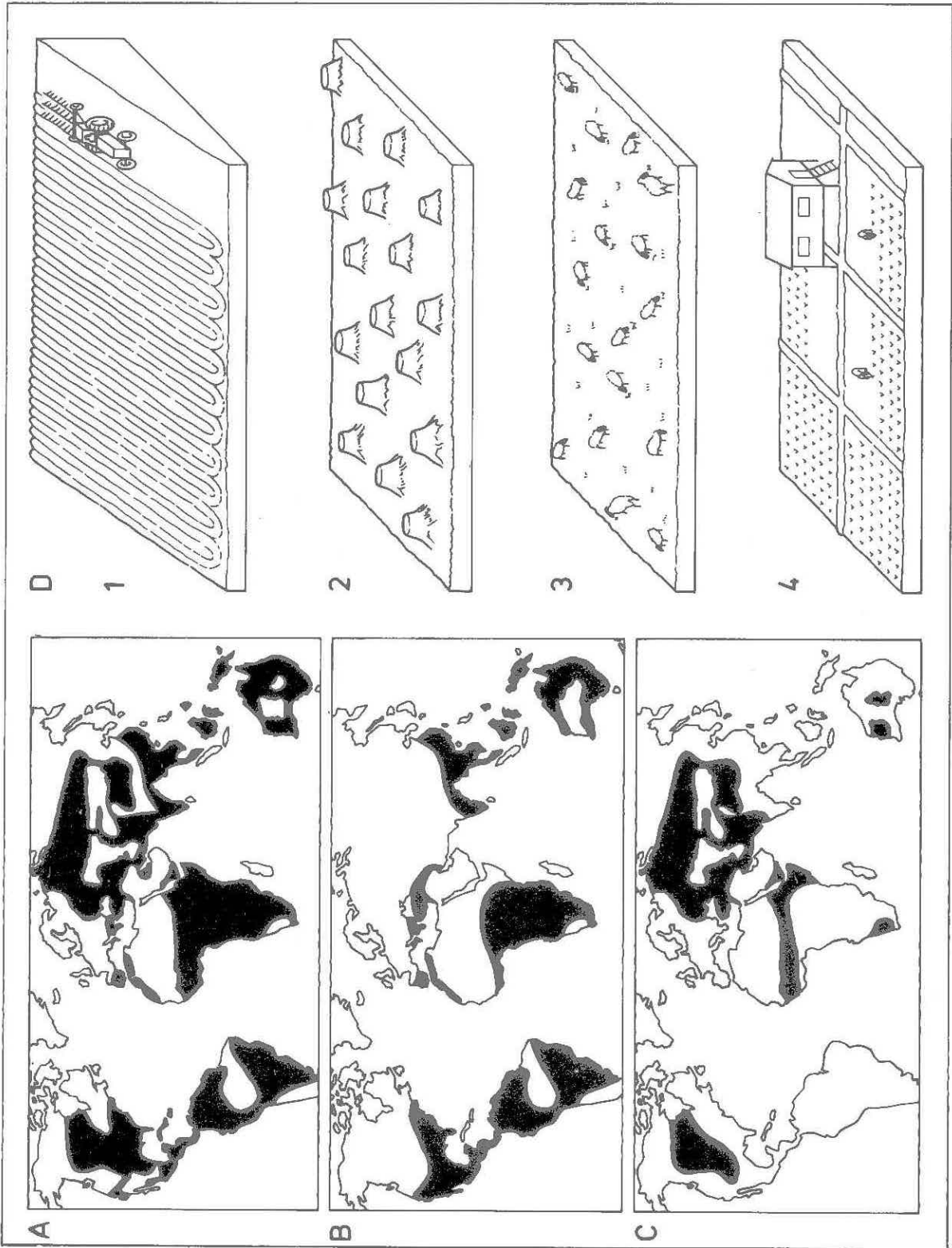
Unbalanced development that does not take into account the conservation of the environment, especially land, will only ruin the future of mankind. The benefit from this type of development would only be temporary. Disasters such as landslide, erosion, and flash floods may soon follow extensive or total clearing of hills and mountains. Even though there appears to be progress made, it will not last very long. Actually, hills and mountains, that are created by God the Almighty have an important role of strengthening the environment. This is explained in verse 7 of Surah Qaaf of the Holy Quran:

And the Earth - We have spread it out, and set thereon mountains standing firm, and produced therein every kind of beautiful growth (in pairs)

One human activity normally regarded as good and beneficial is gardening. However, if gardening is not done properly, then it may damage the land. This is due to:

- Endangered plant species (wild flowers and cacti) are removed from their natural habitats for gardens.
- Peat is extracted from bogs for use in compost. This cannot be replaced.
- Massive quantities of chemicals are sold to gardeners. Incorrect usage may pollute the environment.
- Spraying pesticides upsets the natural balance of pests and predators in the garden.
- Standard plant breeds discourage the retention of older varieties, thus reducing genetic diversity.
- Concrete gardens drive out wildlife.
- Burning organic waste pollutes the atmosphere and prevents its recycling as compost.

Figure 5.7: Soil Erosion



- A** Regions at risk from erosion worldwide
- B** Regions at risk from water erosion
- C** Regions at risk from wind erosion
- D** Causes of erosion
- 1 Downslope plowing
- 2 Deforestation
- 3 Overgrazing
- 4 Monoculture

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Apart from haphazard land use, another factor that destroys land is salinisation. Salinisation is due to uncontrolled irrigation schemes with poor drainage which make the soil salty. Crops cannot survive under these conditions, so the land becomes useless for agriculture. Neither will it attract animals. Evaporation of salty water used to irrigate plants leaves salt behind in the soil. This affects plant growth. Evaporation also draws up groundwater. Rising groundwater brings more salts to the surface. The high level of salinity kills plants, converting the area into barren land.

The other consequence of human activity that has a detrimental effect on the land is erosion. Land is an element that is highly sensitive to manipulation. Therefore, any human assaults on the land must include ways to conserve it. Erosion is a phenomenon that is often seen throughout the world. Apart from causing financial and economic losses, erosion in the form of landslides, also threaten human safety and endanger life. Figure 5.7 (A - Regions at risk from erosion worldwide, B - Regions at risk from water erosion, C - Regions at risk from wind erosion) shows the areas in the world which are threatened with erosion. Malaysia is in the group of countries threatened with erosion. In some countries, the wind is an agent that causes erosion. Human activities that may cause erosion include :

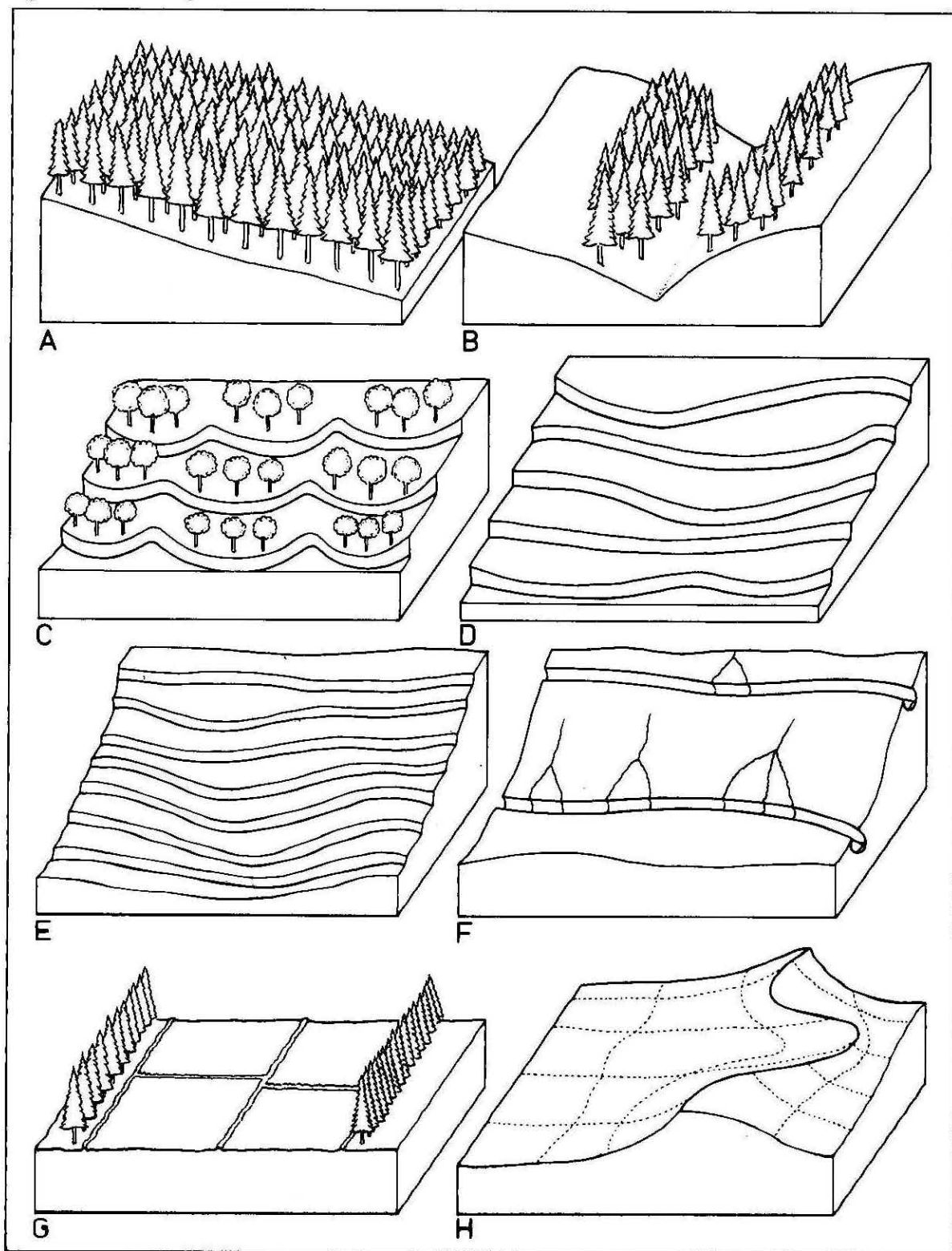
1. Downslope clearing and plowing eliminate plants which can hold the soil from being carried downhill by runoff rainfall.
2. Extensive and uncontrolled deforestation.
3. Overgrazing
4. Monoculture, or the extensive and prolonged cultivation of one type of plant.

A study was conducted on the degradation of soils in dry regions. For a region full of vegetation, such as a forest, there is no soil lost by erosion, and the rainfall retained for its use is 99.6%. On the contrary, in a barren region, the amount of land lost by erosion is 5.84 metric tonnes per hectare per year, while the rainfall lost as runoff is 50.4%.

*Deforestation
leads to barren land*



Figure 5.8: Preventing Desertification



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Eight methods of preventing desertification

- A Reforestation
- B Tree-planting along gullies
- C Growth of tree crops on higher, smaller terraces
- D Terracing of step land
- E Cultivation of land along contours
- F Building embankments
- G Planting shelter belts and windbreaks
- H Stabilizing sand dunes

DESERTIFICATION

The other threat to the soil is desertification. Some of the more common human activities which cause desertification are:

- Overcultivation of poor soils, which often happens in semi-arid countries.
- Overgrazing by sheep, goats, cattle and camels of fragile marginal lands.
- Rapid growth of human population which requires the opening of settlements.
- Cutting of fuelwood in cold areas.
- Deforestation, especially of watersheds.
- Inappropriate irrigation practices leading to salinisation of land.
- Long-term climatic change, like the effects of El Nino on crops.
- Civil strife where heavy and high-technology weapons are used, could damage land and plants.

Figure 5.8 shows some of the precautions that can be taken to prevent desertification, which include:

CONCLUSION

As human beings on Earth, we must realise that all God's creation have a reason to exist. As consumers of the environment we must be wise so that we do not fulfil our needs at the expense of the environment. Everything that has been created by God the Almighty, is solely for our own good. This is stated in verses 30-33 of Surah an-Naaziat of the Holy Quran:

And the Earth, moreover, has He extended to a wide expanse; He draws out therefrom its moisture and its pasture; and the mountains has He firmly fixed, for use and convenience to you and your cattle.

PLANTS

BY
ABU BAKAR ABDUL MAJEED

And in the Earth are tracts diverse though neighbouring, and gardens of vines and fields sown with corn, and palm trees, growing out of single roots or otherwise: watered with the same water, yet some of them We make more excellent than others to eat. Behold, verily in these things there are signs for those who understand!

Surah Ar-Ra'ad: verse 4

Look at the scenery around your house or school. Is your environment full of trees and plants? Does a green environment give you a relaxed and nice feeling? Doctors say that a beautiful landscape filled with green plants can relax the mind and reduce stress.



The Earth is rich with plants and animals, or otherwise known as the flora and fauna, respectively. Millions of species of flora and fauna have been identified. However, according to scientists, many are extinct or have been lost forever. Biodiversity increases gradually from the North and South poles, to the needleleaf and broadleaf forests, the Prairie grassland, the deciduous forest in the temperate zone, the savanna in the tropics and finally, the tropical rain forests at the equator, that include the Malaysian forest.

The equatorial region receives a lot of sunshine. It also gets frequent and heavy rainfalls. The land in tropical rain forests is extremely fertile. Plants can grow at a very fast rate. They are the basic component of the food chain.

Green leaves capture the sunlight with the help of chlorophyll. Chlorophyll breaks the water molecule into hydrogen and oxygen. Part of the oxygen is released to the environment. Hydrogen combines with carbon dioxide absorbed from the environment to form sugar. This sugar is converted to starch and then stored. The process is known as photosynthesis. Although simple, photosynthesis is vital for human and animal life.

Protein is formed in plants through the use of minerals absorbed from the soil by the roots. Plants are the only living organisms able to synthesise or produce their own food.



Plants form the basis of the food cycle

Forest plants are continuously changing. Although they seem to be there all the time, the fact is that they have to constantly compete for sunlight, water and minerals. Only the fittest will survive. The change in climate can also influence the competition between one species and another.

In order to avoid competition, some plants are able to look for new, uninhabited territories. A barren land could become fertile if there were a climatic change there. When there is rain, then the land becomes suitable for new plants to grow and start a new colony.

The moss is an example of a plant able to set up the first colony in an arid and barren land. Later, grasses, runners and small plants will follow suit. The land then gradually becomes fertile as more new plants start to grow. Their roots will capture more water and hold it over a longer period. Organic materials due to the decaying plants will accumulate. The plants' root systems hold the soil better and prevent erosion. This helps to maintain soil quality.

In the Middle East, parts of the desert have been converted into agricultural areas through land reclamation programmes. Man-made irrigation and land restoration programmes have enabled deserts to be used for agriculture. Through these programmes, crops like wheat and barley can be cultivated.

On the contrary, if trees were cut and forests cleared, many problems would arise. Rainwater can cause soil erosion. The soil becomes less compact and may collapse. Plants that grow on this soil will also fall and be destroyed. The eroded soil will flow into the river and form sedimentation. The river may be blocked and water will not flow smoothly. Therefore, the whole ecological system will be affected.

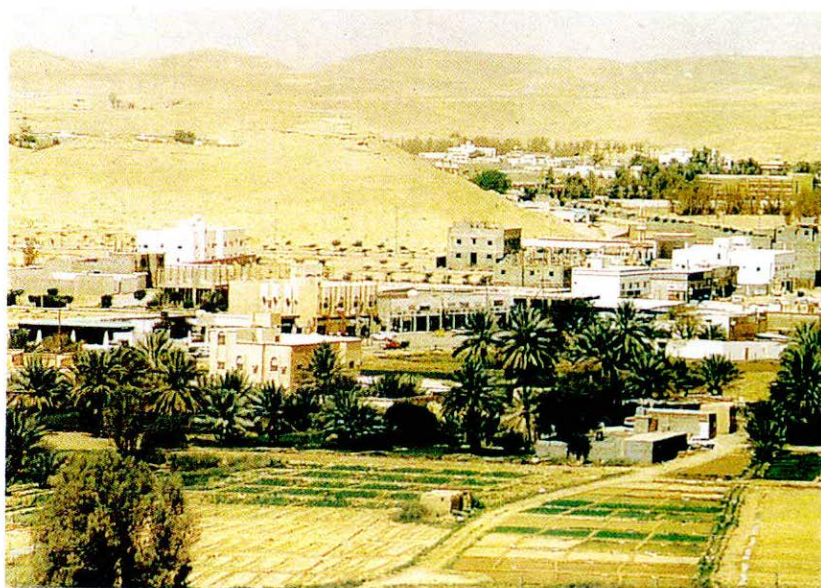
Have you ever ventured into the forest or bushes near your house? Have you ever trekked and camped in the forest reserves of Malaysia, such as the National Park? Surely, you must have noticed that in the forest, there are numerous types of plants, insects and birds. The tropical rain forest, in fact, is an example of an environment filled with numerous species of living organisms.

For example, a single tree in the tropical rain forest may support up to 150 species of beetles. In one hectare alone of the forest, there may be 300 different species of plant and 41,000 different species of insect. The total number of plant species in the tropical rain forest is estimated at 4000.

The tropical rain forest is scientifically important. Here, scientists can conduct research to study the ancient world, and how it evolves over the years to the present one. The tropical rain forest started millions of years ago. Historians and archeologists believe that important evidence of ancient life can be found in the rain forest.

The tropical rain forest also provides the site for studies on ecological systems, or ecosystems. Ecosystems describe the interaction between living organisms and the environment that allows them to continue to live comfortably. The tropical rain forest ecological system is among the

most stable ecosystems and has survived for millions of years. If we lose the rain forest, then the chance to study the history of the world would be diminished.



An agricultural area in the desert

Destructive activities, like deforestation, are now taking place in a frantic way. For example, about 50,000 km² of the Amazon jungle of South America is destroyed in a year. In 1980 alone, throughout the world, 75,000 km² of forest have been ravaged. Logging is carried out on a big scale and without proper planning. The aim is to get maximum profit from the sale of timber. Money can be made easily and quickly. Buyers of timber are always ready to accept shipment, regardless of where it comes from. The wood-building and furniture industry is indeed very profitable.

Irresponsible settlers indiscriminately burn large areas of forest. Their objective is to set up a new settlements or carry out large-scale farming. However, when the fire starts to spread, it may be uncontrollable.

Remember the forest fire tragedy in a neighbouring country that brought serious and persistent hazy condition to Malaysia in the middle of 1997? We had to face many problems then. The health and safety of the people of Southeast Asia were threatened. Their economies were also affected. The tourist industry suffered a heavy loss. Therefore, it is clear that due to the irresponsible attitude of a few individuals, the health of hundreds of millions of the region's population was affected.

Tropical rain forests are also destroyed by the activities of prospectors, in search of gold and precious stones. They normally pollute rivers with chemicals, such as mercury, used to separate the minerals from the ores. Water containing mercury can kill plants that grow along the rivers.



Indiscriminate logging threatens ecological systems

Although efforts to destroy the rain forests are continuing, the majority of the world's population now realises the importance of sustaining these enclaves for the future of mankind. Therefore, various environmental restoration projects and campaigns are being implemented. The focus of these activities is to protect the tropical rain forest.

Reforestation projects are actively being carried out. Logging is done in a controlled and planned manner, by taking into account its effects on the ecosystem of the area. Forest reserves have also long been gazetted.

In Malaysia, a programme to plant trees throughout the country was started in 1997. It aims for 750,000 trees to be planted annually. The total is expected to reach 3 million trees in the year 2000. By the year 2020, the number of trees planted is estimated to be more than 20 million. Each individual is urged to plant as many trees as possible in the surrounding areas. Local authorities, such as town and district councils, are responsible for planting new trees in and around cities and villages. You too, can contribute to this project. Please help your parents to keep the area around the house green, in line with the effort to make Malaysia a 'garden country'.

Intensive and continuous education on the environment is given to all levels of the society. Through this integrated effort, it is hoped that future generations can enjoy the greenery and tranquility of the tropical rain forest.

The environment is flexible and can change from time to time. Man can influence this change in any way he likes. Agriculture, farming, breeding and physical development is based on this change. If the changing of the environment were done with malice, or without proper respect for the Creator, then the benefit would certainly not last. Destruction and pollution will occur when the environment is abused.

Every religion of the world denounces environmental abuse. The reason for the existence and evolution of the world is a divine mystery. Everything happens on the wish and command of God the Almighty. Man has been appointed as the temporary guardian of this Earth. Therefore, it is incumbent upon man to carry out his responsibility honestly and wisely.



ANIMALS

BY
ABU BAKAR YANG

And in cattle too, you have an instructive example; from within their bodies We produce milk for you to drink; there are, in them, besides numerous other benefits for you; and of their meat you eat; and on them, as well as in ships, you ride.

Surah al-Mu'minin: verses 21-22

Man is God's best creation. Besides man, there are many other forms of creation. They include animals. There are many types of animals worldwide. Although man is the best of God's creation and one who has been given certain privileges, it does not mean that he is free to do what he likes onto others. In fact, it is incumbent upon man to act in a just manner, and ascertain that the welfare of other organisms living with him in this world is well looked after. The Holy Quran reveals that animals can serve man, as stated in verse 8 of Surah an-Nahl.

And He has created horses, mules, and donkeys, for you to ride and use for show; and He has created other things of which you have no knowledge.



In a century, man has made great strides in science and technology. Despite this, he has not fully understood how animals live, although they share the same world. Science is still unable to determine the exact number of animal species on Earth. What is often described and discussed is an estimate number from various research findings. There are between 4 to 100 million species of living organisms in the world. However, only 1.5 million species have been catalogued. It is sad that many of the species will never be known as they are now extinct, probably due to the development initiated by man.

How could this happen? Many people know that some large animals such as dinosaurs, are extinct. However, there are numerous other species of plants and small animals, such as insects, that face extinction daily. In fact, some will become extinct even before they can be discovered. It is true that the dodo bird has become extinct for a number of years. It is also true that currently the blue whale and the black rhino are facing extinction. But we are not aware that thousands of species of insects are threatened with extinction through the mass destruction of their habitats; a prime example of this is the destruction of the tropical forests, ecosystems with the richest biological diversity on Earth.

THREATS TO WILDLIFE

It is estimated that by the year 2000, more than a million species of animals and insects will become extinct, with many more disappearing in the 21st century. These insects and animals may be important to human, as sources of new medicine.

Figure 7.1 is a summary of the distribution of animals in the world.

One of the threats to the safety and survival of animals is the destruction of their habitats by man. The majority of animals live in the forest, where food is abundant. The forest is also the natural home of the animals. Most of the forests are found in the tropical region, such as Southeast Asia, South America and Central Africa.

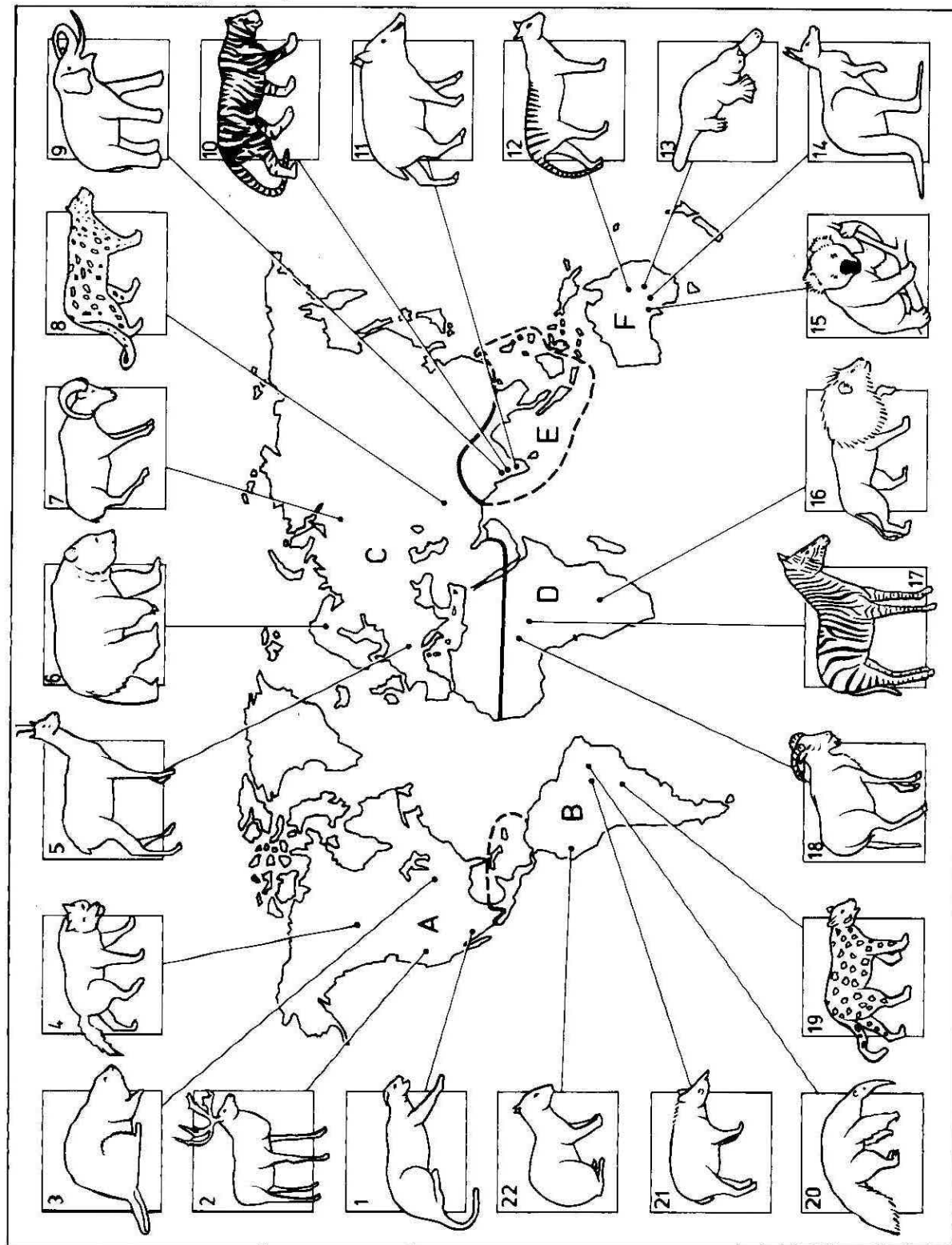
Figure 7.2 shows tropical forests and the percentage of animal and plant species found in them. About 45% of the animal species are found in tropical forests. More than 90 % of world's insect species, 30% of world's bird species and 45% of world's plant species inhabit these forests.



However, many of these forests are now under threat. They have been destroyed in the name of development. The rate of destruction is worrying. Among human activities which contribute to the destruction of forest habitats are:

The Humpback whale is on the brink of extinction

Figure 7.1: Zoogeographical Regions

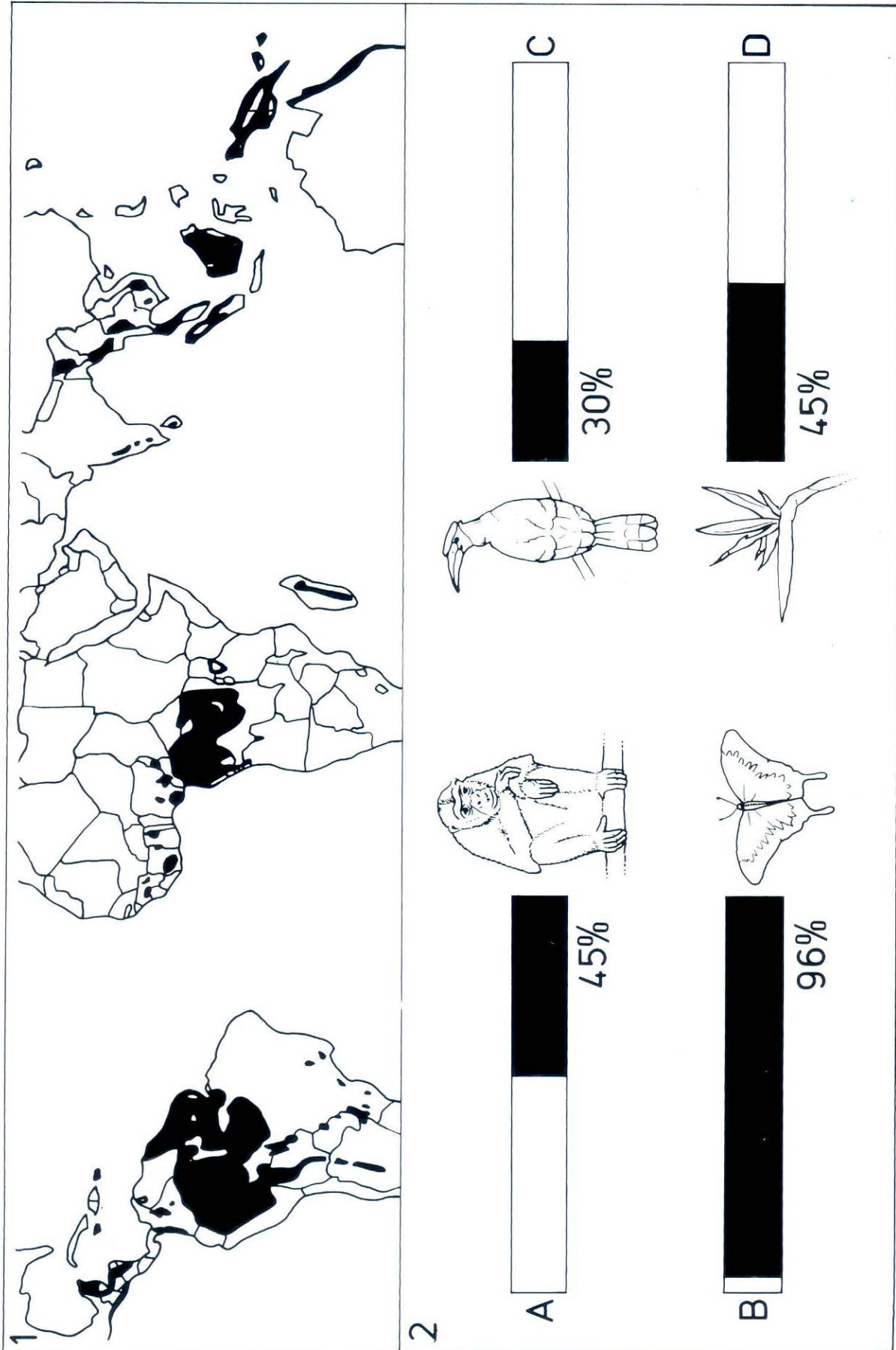


- Regions**
- A Nearctic
 - B Neotropical
 - C Palaearctic
 - D Ethiopian (Afro-tropical)
 - E Oriental
 - F Australasian

- Characteristic animals**
- 1 Cougar
 - 2 Caribou
 - 3 Beaver
 - 4 Wolf
 - 5 Chamois
 - 6 Brown bear
 - 7 Argali
 - 8 Snow leopard
 - 9 Elephant
 - 10 Tiger
 - 11 Indian boar
 - 12 Thylacine
 - 13 Platypus
 - 14 Kangaroo
 - 15 Koala
 - 16 Lion
 - 17 Zebra
 - 18 Aoudad
 - 19 Jaguar
 - 20 Anteater
 - 21 Tapir
 - 22 Agouti

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Figure 7.2: Tropical Forests And Their Species

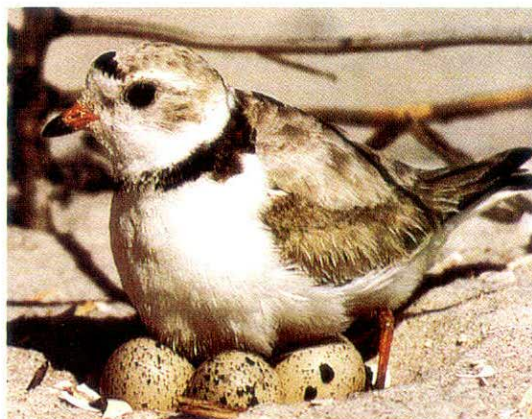


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1 Tropical forests
 2 Percentage of world's species found in tropical forests
 A All animals
 B Insects
 C Birds
 D Plants

- ❑ deforestation for commercial purpose, such as logging.
- ❑ change in land status, from forest land to agricultural land.
- ❑ newly-opened areas for the industry.
- ❑ newly-opened areas for human settlements.

Figure 7.3 shows major habitat loss up to 1990 in countries with high biological diversity, including Malaysia.



The wildlife habitat must be protected

Apart from the destruction of the habitat, the following are also factors contributing to animals' extinction:

- Excessive fishing
- Excessive hunting
- Wildlife trade
- Water, air and land pollution, killing many animals

Figure 7.4 shows the difference between the number of described species and the estimated total number of species on Earth.

Wildlife trade

The wildlife is a source of fur and hides, that can be made into clothes, tents and ornaments. The price of these goods is high. The Quran mentions some of the benefits derived from animals. Verse 80 of Surah an-Nahl is translated as:



A leather jacket from animals' hide

It is Allah who made your habitations homes of rest and quiet for you; and made for you, out of the skins of animals, tents for dwellings, which you find so light and handy when you travel and when you stop in your travels, and out of their wool, and their soft fibres between wool and hair, and their hair, rich stuff and articles of convenience to serve you for a time.

Nevertheless, wildlife trade has been exploited to the fullest, so much so that some of the animal species have become extinct. This problem must be dealt with immediately in order to prevent more species from disappearing.

Figure 7.5 is a summary of statistics of CITES - the Convention on International Trade in Endangered Species of Wild Flora and Fauna - on wildlife trade (export) in 1988 of selected countries.

Figure 7.6 shows statistics on wildlife trade (import) by the same countries.

Endangered species

Endangered species are species whose populations have dropped to such low levels that their continued survival is in question. Figure 7.7 shows several species of animals listed under the endangered species and threatened species categories. The latter are less vulnerable than the former but are likely to become endangered in the coming century.

In addition, there are many other species categorised as endangered. Examples of these are the two large mammalians, one living in the ocean, the whale, and the other on land, the elephant. Based on figure 7.8, we can see that the number of whales remaining is much smaller than the estimated number in existence in the past. The blank box indicates the estimated population size before hunting for commercial purpose, while the shaded boxes represent the estimated population size in 1990.

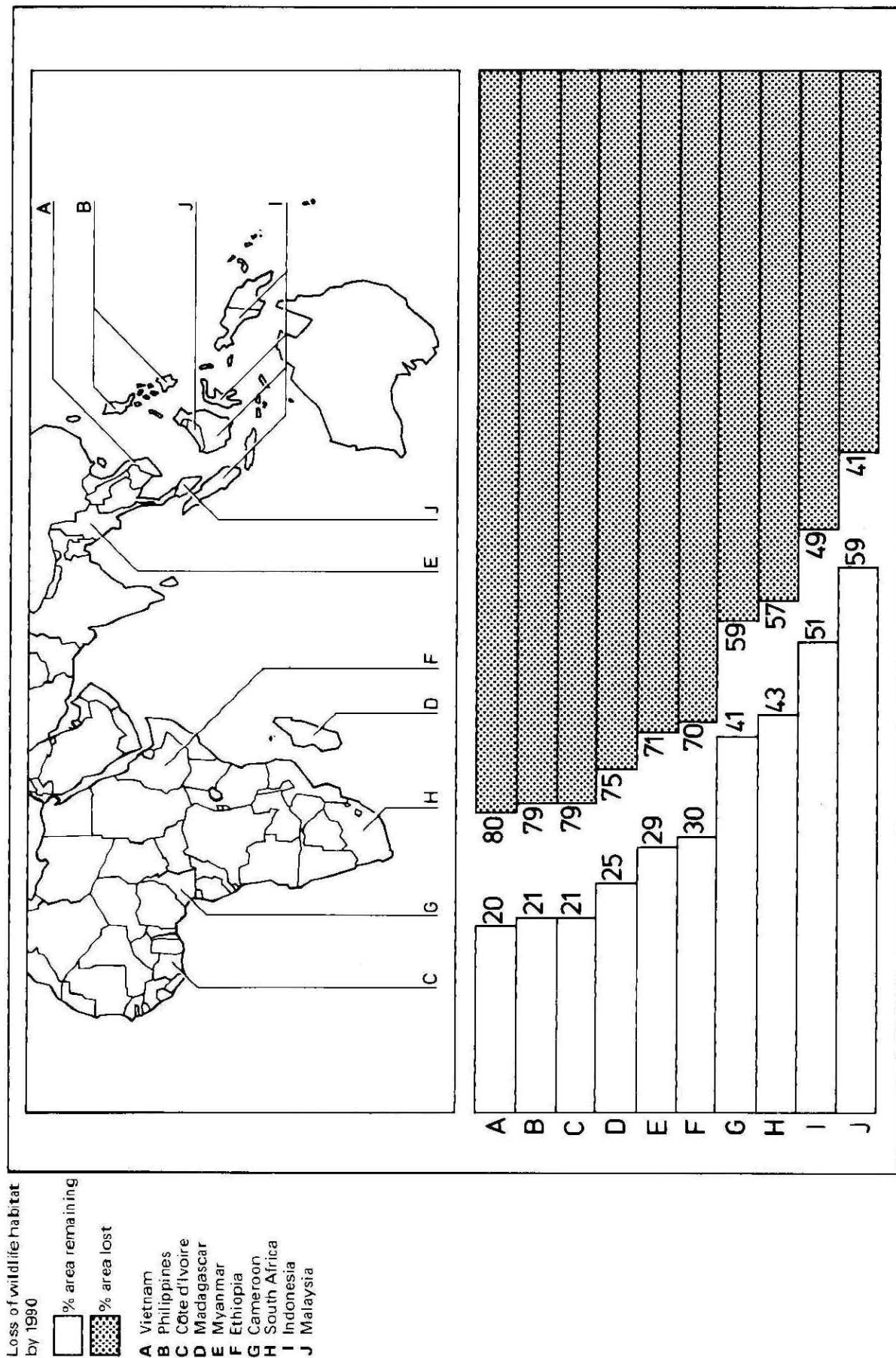
Islam reminds us that the technology that we own should not be used as a show of strength. For example, modern fishing technology, such as the use of long drift or gill nets, needlessly kills other species, including dolphins and seals. Islam teaches man to be thankful of God's blessings and to be wary of transgressing His limits. This is specified in verse 14 of Surah an-Nahl of the Holy Quran:

It is He Who has made the sea subject, that you may eat thereof flesh that is fresh and tender, and that you may extract therefrom ornaments to wear, and you see the ships therein that plough the waves, that you may seek thus of the bounty of Allah and that you may be grateful.

From figure 7.9, we can see why there is a rapid decrease in the number of whales. Uncontrolled whaling has caused a severe decline in the population of many whale species in this century (1910-1989).

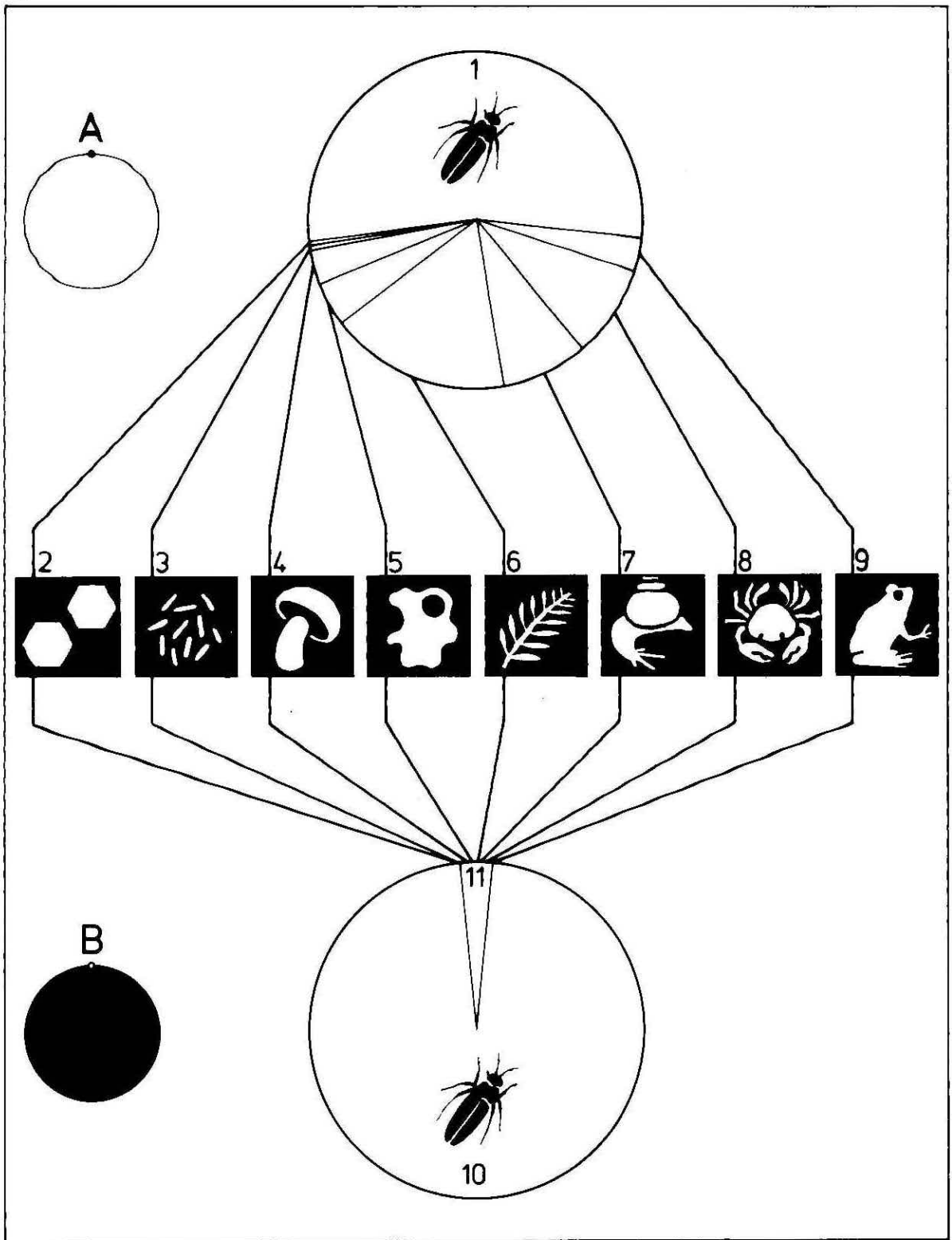
Meanwhile, the elephant's population the world over has declined by more than 50%. According to figure 7.10, the elephant population decreased from a total of 1.3 million worldwide in 1979, to 625,000 in 1989. Most of the countries experiencing a drop in the number of elephants are situated in Africa.

Figure 7.3: Habitat Loss in Countries With High Biological Diversity



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Figure 7.4: Estimated Number of Species



Recent research indicates that there is a great difference between the number of described species and the estimated total number of species on earth

A Number of described species total 1.4 million

- 1 Insects (751,000)
- 2 Viruses (1000)
- 3 Bacteria (4760)
- 4 Fungi (46,983)
- 5 Protista (57,700)
- 6 Plants (248,428)
- 7 Invertebrates other than arthropods (115,600)

- 8 Arthropods other than insects (123,161)
- 9 Vertebrates (43,853)

B Estimated total numbers of species range from 4 million to 100 million. Proportions shown assume a figure of 30.8 million

- 10 Insects (30 million)
- 11 All other species (800,000)

Figure 7.5: Wildlife Exports

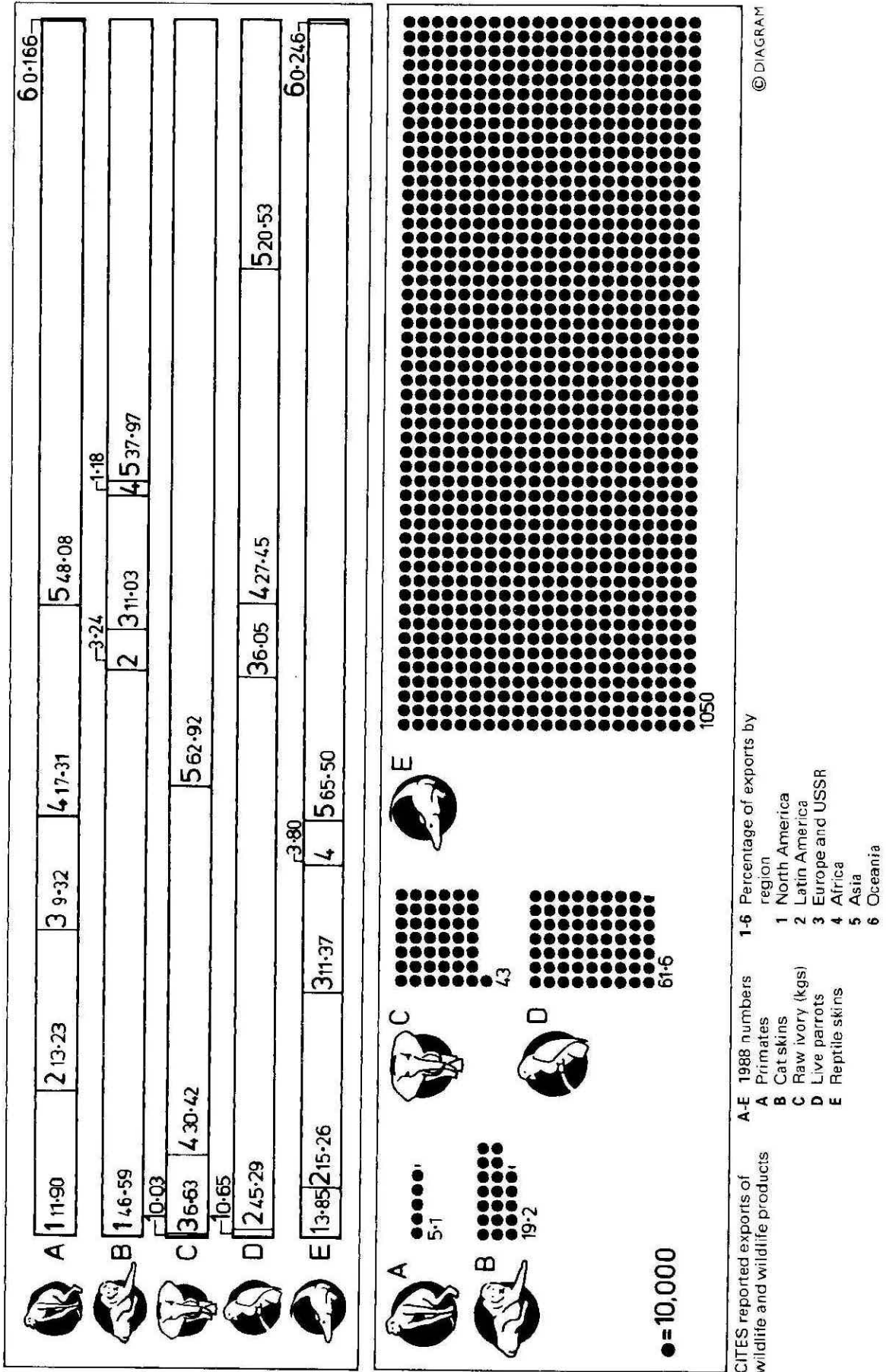
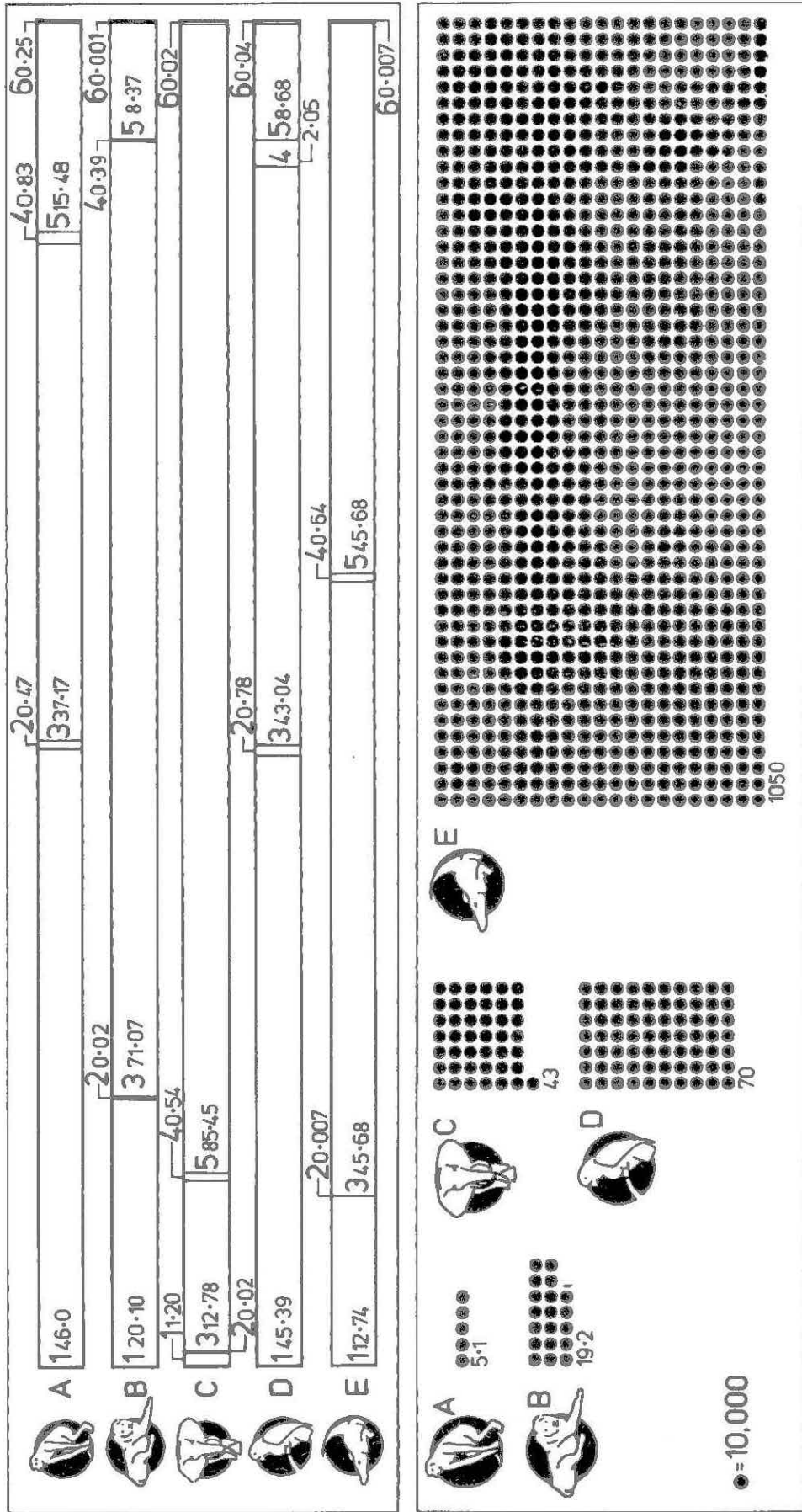
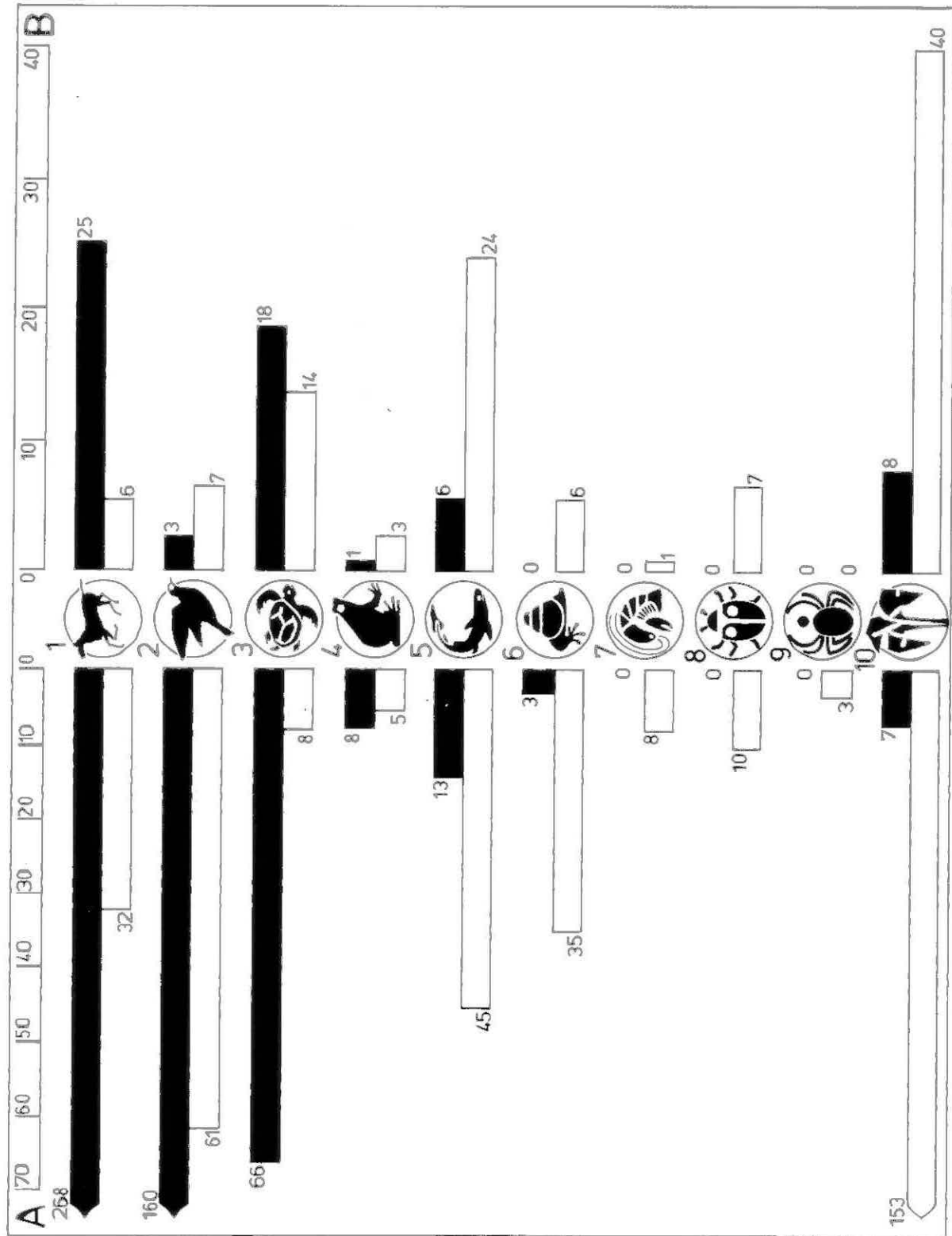


Figure 7.6 Wildlife Imports



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Figure 7.7: Species Listed As Endangered or Threatened



Species in world (not including US)
 Species in US only

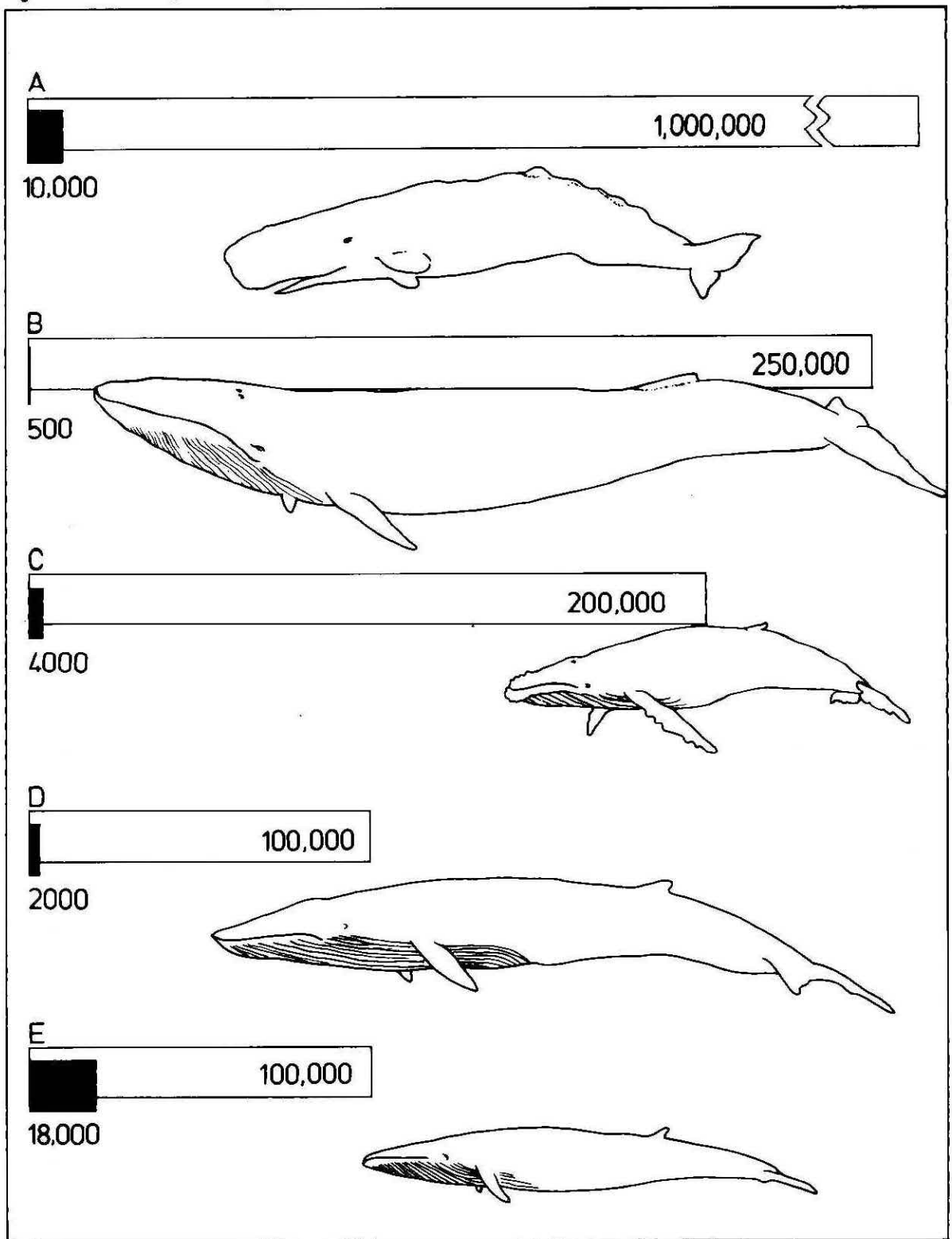
A Endangered species are those whose populations have dropped to such low levels that their continued survival is in question



B Threatened species are less vulnerable than endangered but are likely to become endangered

- 1 Mammals
- 2 Birds
- 3 Reptiles
- 4 Amphibians
- 5 Fish
- 6 Mollusks
- 7 Crustaceans
- 8 Insects
- 9 Arachnids
- 10 Plants

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Figure 7.8: Declining Whale Populations



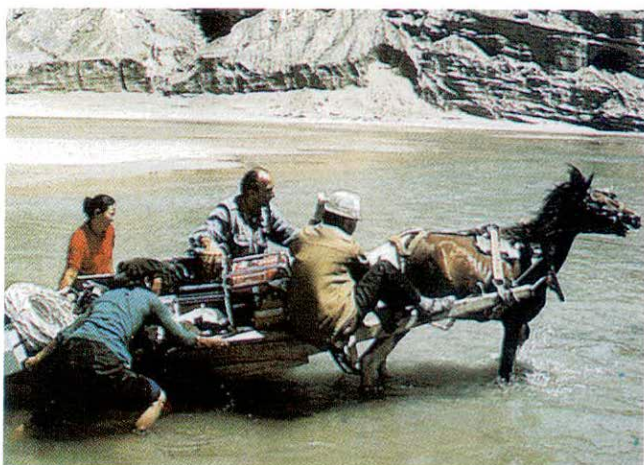
 Estimated population size before hunting
 Estimated population size 1990

A Sperm
 B Blue
 C Humpback
 D Fin
 E Sei

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THE IMPORTANCE OF ANIMALS TO MAN

Animals play a significant role for man. Before the advent of modern vehicles, animals such as elephants, horses, cows and yaks have been used for transportation. Livestock such as cattle, sheep, chickens and ducks are important as a source of food and protein for man.



Today, animals are still used for transport

This is described in verse 142 of Surah Al-An'am of the Holy Quran:

Of the cattle are some for burden and some for meat: eat what Allah has provided for you, and follow not the footsteps of satan: for he is to you an avowed enemy.

Invertebrates are also an important source of food. A good example is the bee. The Quran states the advantages of consuming honey produced by the bees, in verse 69 of Surah an-Nahl:

Then to eat of all the produce of the earth, and find with skill the spacious paths of its Lord: there issues from within the bees a drink of varying colours, wherein is healing for men: verily in this is a sign for those who give thought.

The nutritional value of honey has been proven by the modern medical practice. It is considered as an important food supplement.

Fish is another important source of food. Reptiles and amphibians provide hides for commercial use.



Bees produce honey that is good for health

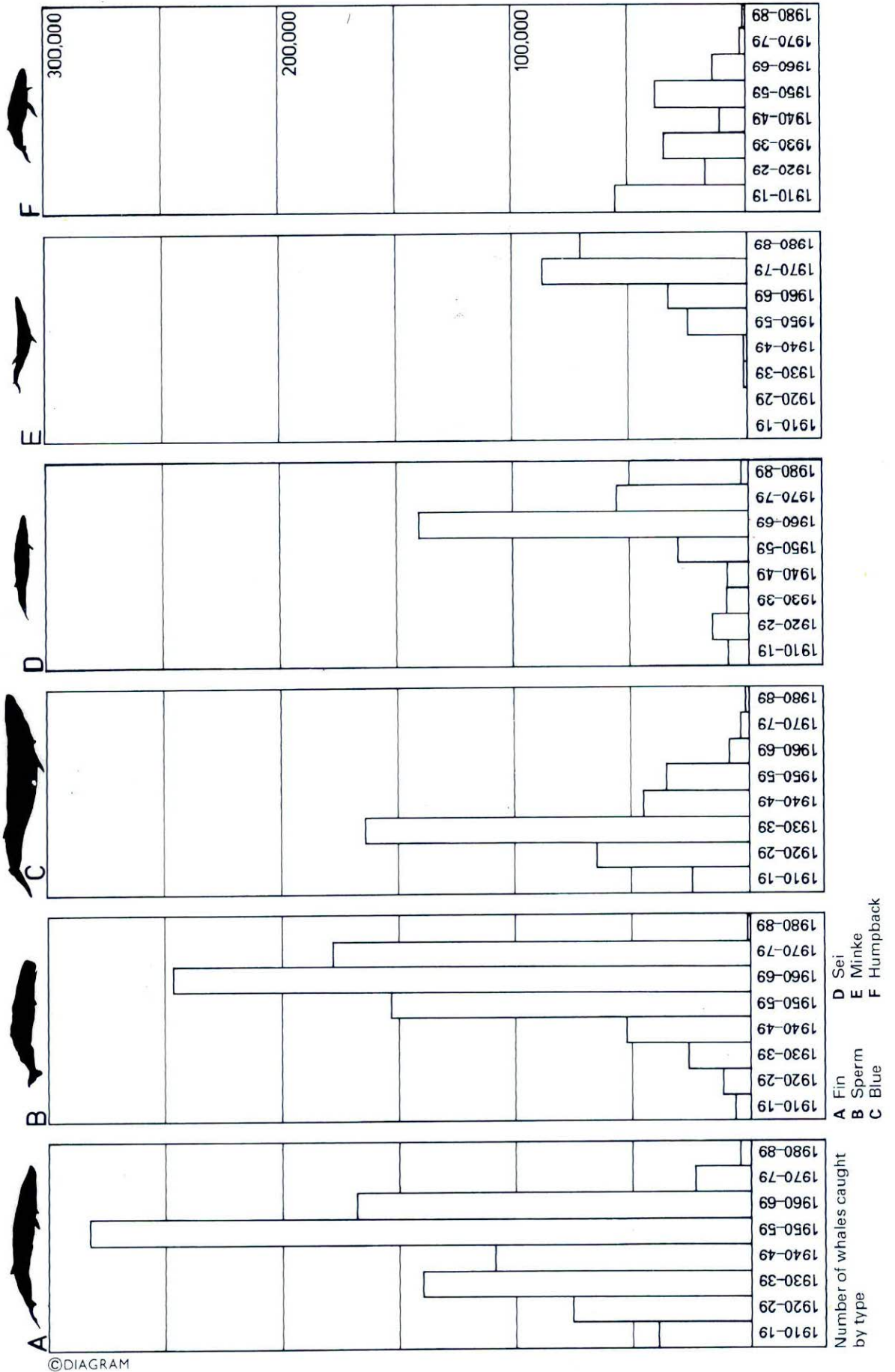


Animals' meat is a source of food

SOLUTIONS

The World National Parks Congress in 1982 recommended that 10% of the Earth's land area should be protected to safeguard biological diversity. However, only 3% is currently so protected. Some of the steps taken by the National Protection Systems to protect world's wildlife habitat include:


Figure 7.9: World Whale Catches



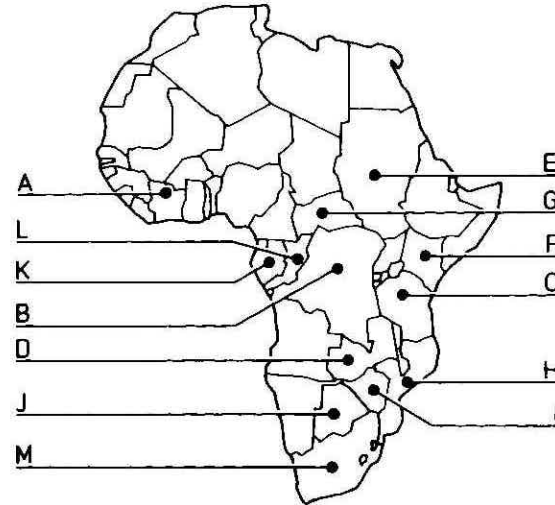
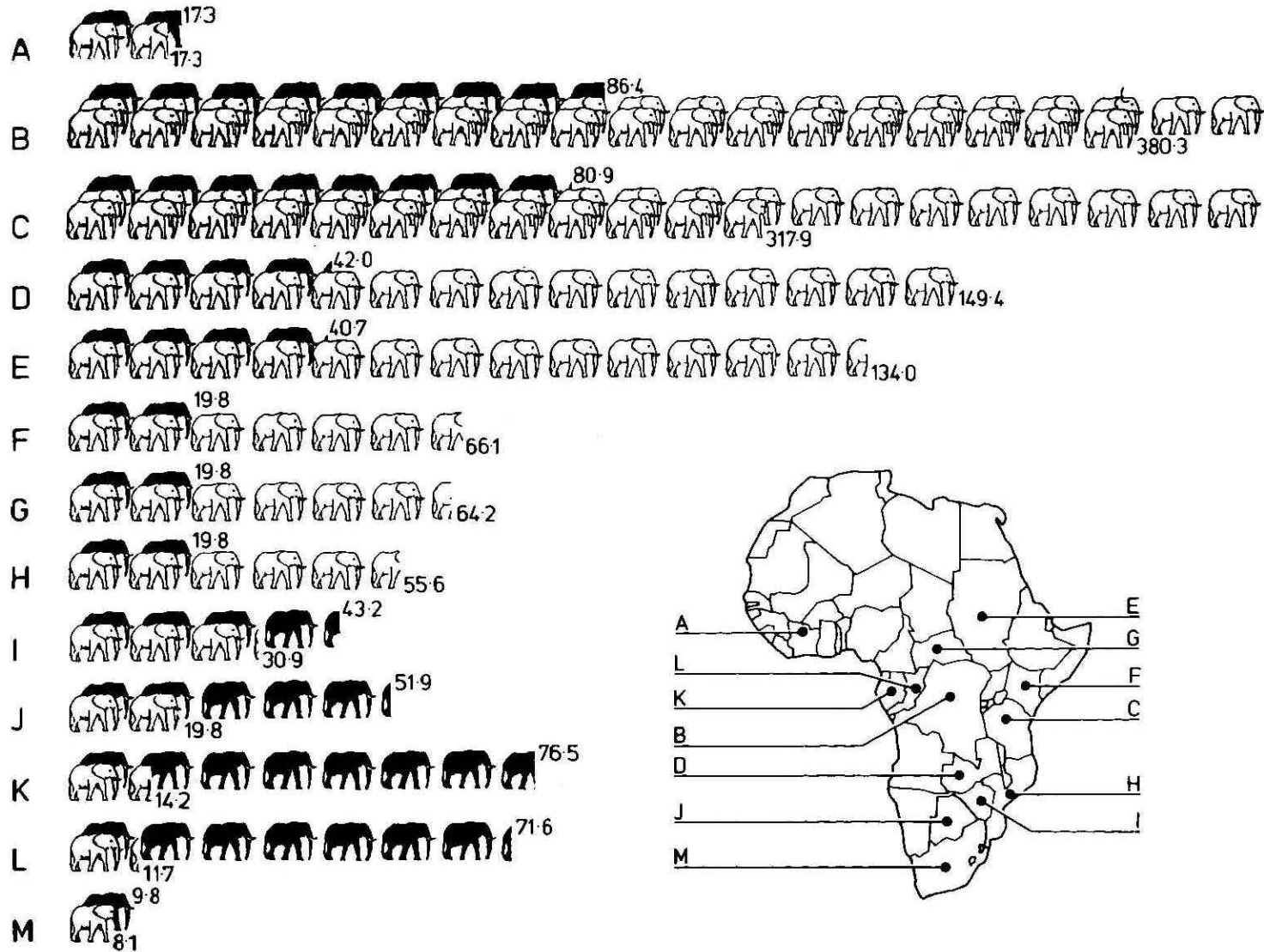
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African elephant population (in thousands)

 1979
(1.3 million total)

 1989
(625,000 total)

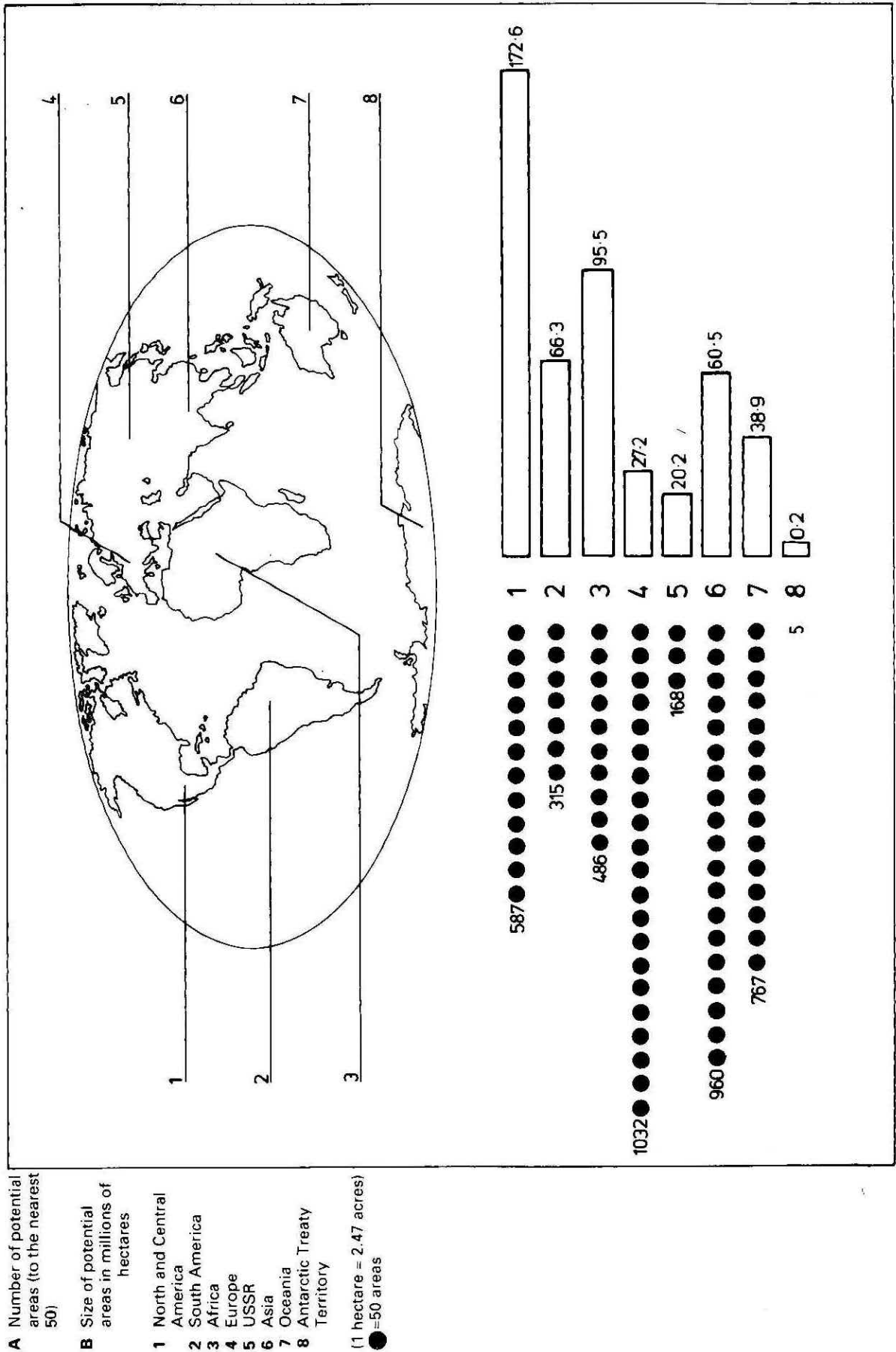
- A West Africa
- B-M Central and southern Africa
- B Zaire
- C Tanzania
- D Zambia
- E Sudan
- F Kenya
- G Central African Republic
- H Mozambique
- I Zimbabwe
- J Botswana
- K Gabon
- L Congo
- M South Africa



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Figure 7.10: Changes In African Elephant Population 1979-89

Figure 7.11: Areas Protected Under National Protection Systems



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- to create scientific and nature reserves.
- to protect landscapes and seascapes.
- to conserve habitats for threatened species.
- to set up biosphere reserves.
- to designate world heritage sites.

Figure 7.11 summarises areas protected under the national protection system.

CONCLUSION

Animals created by God the Almighty are of significant value to man. They are not merely a source of food, but can also be used for transport, as a pet, or as a source of materials for clothing. The importance of animals to man is explained by verses 5-7 of Surah an-Nahl of the Holy Quran:

And cattle He has created for you men: from them you derive warmth, and numerous benefits, and of their meat you eat. And you have a sense of pride and beauty in them as you drive them home in the evening, and as you lead them forth to pasture in the morning. And they carry your heavy loads to lands that you could not otherwise reach except with souls distressed: for your Lord is indeed Most Kind, Most Merciful.

In addition, Islam provides guideline on how to care for the animal.

- Time, expenses and effort must be fairly distributed to pets, regardless of whether they are well or sick.
- Do not overburden animals with excessive load.
- Do not mix animals in the same cage if one could attack another.
- Slaughtering must be done in a proper manner.
- Slaughtering of very young animals is discouraged.
- If an animal is kept in a cage, then it must continuously be provided with sufficient food and drink, and the cage kept clean.
- Do not separate the male from the female.
- Do not hunt animals with weapons that can break their bones or kill them in the *non-halal* (non-permissible) way.

MAN

BY
ABDUL MONIR YAACOB

O mankind! Reverence your Guardian-Lord, Who created you from a single person, created, of like nature, his mate, and from them twain scattered like seeds countless men and women - fear Allah, through Whom you demand your mutual rights, and reverence the wombs that bore you: for Allah ever watches over you.

Surah An-Nisa': verse 1

Man is the most unique of God's creatures. He is made up of body and soul. Man is blessed with the mind that can handle knowledge. Most importantly, he has the ability to learn. With these potentials and capabilities, man is able to develop and prosper the world. This is in line with God's purpose of creating man. Man is the benefactor of the wealth found in the



Earth's crust and oceans. They can also control the space. Clearly, God the Almighty has created the world and everything in it for the comfort and peace of man.

The universe, with its planet Earth that supports life exists to fill the need and demand of man.

Men are of different races and creeds. They also speak different languages. However, they are told to get to know one another, regardless of their differences. Men are required to interact. In the social context, they should live as neighbours, respecting and caring for the environment. In this respect God states;

O mankind! We created you from a single pair of a male and a female, and made you into nations and tribes, that you may know each other not that you may despise each other. Verily the most honoured of you in the sight of Allah is he who is the most righteous of you. And Allah has full knowledge and is well-acquainted with all things.

Surah Al-Hujurat: verse 13

The human body is made up of bones, skeletons, flesh and skin, supported by blood and nerves. Man has to breathe to stay alive. The body needs ample food and drink to grow and be healthy. The food and water must be safe to avoid sickness and diseases.



All men are created the same except for the skin and hair colour, facial feature and spoken language

According to Islam, physically man originates from the soil. Ideally, his food should come from the Earth, such as plants. For example, the primitive society obtained food direct from the environment. However, in this era of science and technology, food is prepared commercially and scientifically. Therefore, food of high quality and wide variety is available. Quality food can promote the development of quality minds, that are more dynamic and active.

Man shall continue to develop his potential to the maximum to fulfil his needs, especially in ensuring his survival. Life and health may be compromised if quality food and drink is lacking. This can happen if man ignores the development of the food sector. However, at times, his effort may be negated by disasters, such as floods and volcanic eruptions, that destroy both agricultural and industrial sectors. These disasters are natural phenomena that are beyond his control. They must be seen as challenges from God the Almighty.

Farms and plantations should be developed systematically. There must be a sense of responsibility and honesty. Man sometimes can be negligent in developing these sectors. His negligence and apathy can lead to destruction and annihilation of the natural environment. Therefore, an environmental management system that is efficient, disciplined and ethical is required. A similar approach is needed when man uses pesticides and herbicides. He must use them responsibly. He must be careful where to dispose wastes to avoid polluting the environment. Wastage, too, must always be avoided. The conservation of a healthy and clean environment is highly desirable in life. Therefore, we must practise a healthy lifestyle, by emphasising on cleanliness.



What is the secret of the creation of man?

God has bestowed unlimited blessings on man. These include clean air, fertile soil for plants to grow, and the treasures of the land and the sea. They are all aimed to satisfy the needs and fulfil the requirements of man. It is up to man to develop and manage the blessings properly.

The human body would be affected if the food, drink and air that we consumed were polluted and unclean. Pollution has not happened naturally, but is due to man's own doing. The pollution is now threatening him.

THE CREATION OF MAN

Apart from observing and appreciating the environment, man also needs to ponder on how and why he has been created. Life begins in his mother's womb. Then he is born into this world to become an inhabitant of the universe. What is the secret of the creation?

The initial senses associated with human creation are hearing, seeing and feeling. Feeling is associated with the mind. Man is then given knowledge so that he can know what is best for him. The Quran tells how man has been created in verse 5 of Surah al-Hajj:

We created you out of dust, then out of sperm, then out of a leech-like clot, then out of a morsel of flesh.

The creation of man has not changed at all from time immemorial. The only difference is the nature of man's physical appearance, such as skin colour, hair style and spoken languages. The differences shall continue to exist since they are characteristics of the human species.

A baby born into this world is pure. He is pure both on the outside and inside, that is, mentally and spiritually. His mind is free from any type of beliefs. He learns from hearing, observing and feeling. At the outset of creation, man is without knowledge. Then, he is given knowledge. He is also given physical and mental strengths. Man can then build civilisations based on his capability. After going through life, man will finally become weak again. This happens when he is old, with white hairs and clammy skin. The aging process happens very slowly. When death occurs, man will once again return to the soil. Surprisingly, man is afraid of the environment around the cemetery, whereas nobody will be able to avoid death, and be returned to the Creator. In essence, the serene environment around the cemetery is a reminder that every man shall die.

MAN AS VICEGERENT

Man is often associated with the role of vicegerency on Earth. Do you know what vicegerency means? Actually the word “vicegerency” carries several meanings. Vicegerency may mean “to substitute” or “to replace somebody of a high and respected position who is sick”. As a vicegerent, man has the duty and responsibility to develop and prosper the world in a just manner. God says in the Quran:

It is He Who has produced you from the earth and settled you therein

Surah Hud: verse 61

MAN AND MIND

The mind is the most important feature of man. A complete mind can ensure a respectable man. The mind helps to provide man with guidance to do good deeds and seek the truth, in line with religious precepts. The human mind needs religious guidance as rational thinking alone may not necessarily ensure a good life. Mind without guidance may be based on values that keep



*Man's
irresponsible
attitude can
only destroy
himself*



*Men are of
different races
and creeds*

changing. Something that is good to someone may not be good to others. Mind without guidance, too, may act without considering the negative effects on oneself, his fellow beings and the environment. Mind based on values will create individuals who respect life and constantly work towards caring for the environment.

MAN AND THE ENVIRONMENT

The relationship between man and the environment can be viewed from two angles. First, man has been given the responsibility to prosper the world and reap the benefits of development. This is in line with his role as the vicegerent on Earth. Second, man must research the universe, and use the findings as means to be closer to God the Almighty.

Behold! In the creation of the heavens and the earth; in the alternation of the night and the day; in the sailing of the ships through the ocean for the profit of mankind; in the rain which Allah sends down from the skies, and the life which He gives therewith to an earth that is dead.

Surah Al-Baqarah : verse 164

The relationship between man and the environment involves the feeling of love, care and mutual respect. It also calls for the recognition and conservation of the environment.

CONCLUSION

We constantly hear news of flash floods, landslides, polluted drinking water, oil spillage, buildings collapsing and severe haze. How do you feel when you hear the news or have to face the disasters yourself? Some of us do try to do something, while others do not care very much. The majority, however, simply sympathise but do not take any remedial actions.

Actually, this is the main problem that we are facing, that is, man's attitude. Apathy and indifference towards what is happening to the environment and the changes taking place that are affecting it, can be both negative and dangerous. It is negative because the loss will be borne by the individual, society and country. It is dangerous because in the future, we ourselves will bear the consequences.

Therefore, after you have read this book and understood how fragile the environment is, you should shed the negative values in you. On the contrary, positive values like caring for the environment should be inculcated. One must strive to be environment-friendly. We must also be wise in establishing a smart partnership with the environment. Sustainable development is the way forward.

The Earth, the sky and the environment are all precious gifts from God the Almighty. Man's responsibility is to prosper the world as much as he can. Naturally man who is blessed with a clear mind, has to think of the consequences of his actions. It is hoped that whatever that we do today can help save the world in the future. A bright future for man and the environment depends on our present way of life.



Nature's beauty is a gift of God that must be preserved



Destruction... is this the environment we would "return" to the future generation?

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