

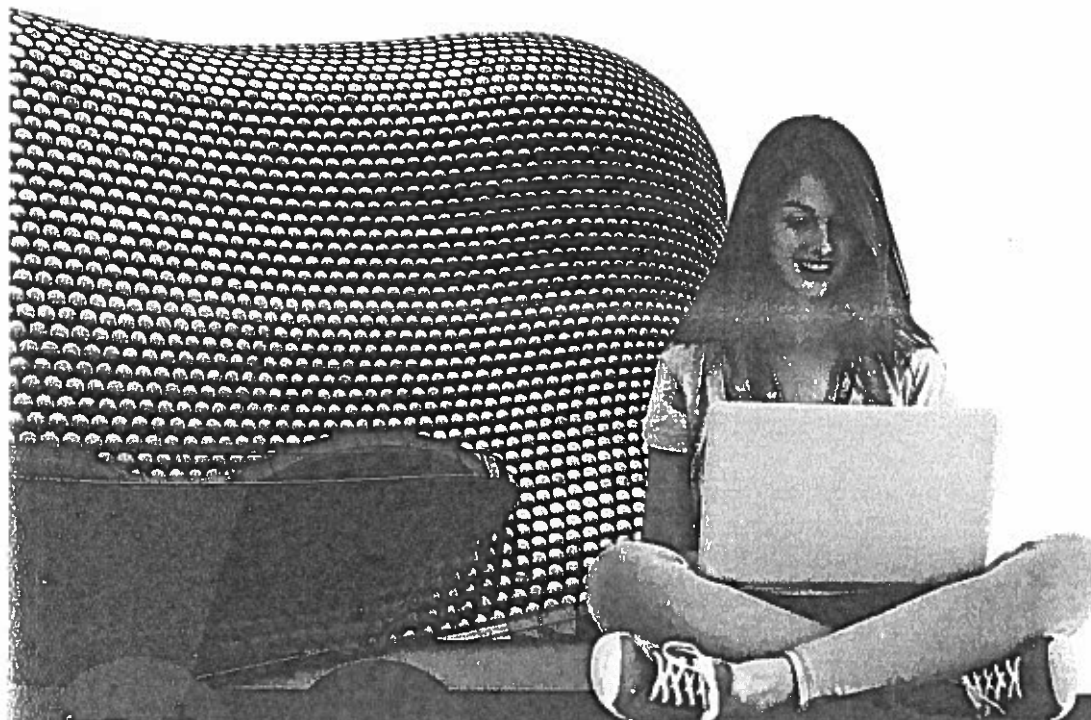
2

MATERIALI IN INGLESE RACCOLTI DALLA PROF.ssa GABRIELLA GASPERINI PER IL LAVORO IN CLASSE NELL' AMBITO DEL PROGETTO DI EDUCAZIONE AMBIENTALE . TERZA PARTE.

A. Galimberti - S. Knipe

BASIC ENGLISH TOOLS

for Technical Communication



4LL

for Lifelong Learning

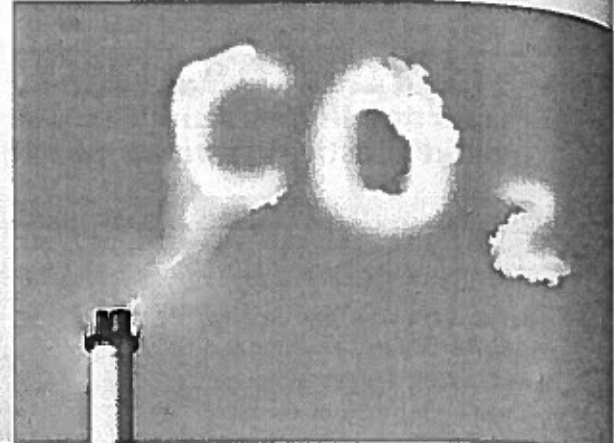
Libro
LIBRO MISTO

M^E
book



MINERVA SCUOLA

A greener environment



DIALOGUE 1

LISTENING AND READING

1 36 Listen and read.

Mike My name is Mike Gregory and I was invited by your CEO, who I'd like to thank for the opportunity given, to talk about how to save energy in car factories. My task today is to show you what was done in the past and what has been done recently to **achieve** a reduction in CO₂ emissions produced by factories and vehicles. We all know that **environmental sustainability** is becoming more and more important in the world...

CEO It looks like an ambitious project, on which Mike has been working for ages. By the time I joined this company, he and his team had already started the development of programmes to educate manufacturers on measures which would improve energy efficiency.

Mike Actually it has never been easy to balance the ability of the automobile industry to make profits with the **aim** of environmental protection, but now **it's high time** we all considered the fact that natural resources are constantly diminishing. Very little was done in the past because we thought we would never **run out of** oil, coal, water, etc.

Ben Do you mean factories have to **turn to renewable energies** with more conviction?

Mike Exactly! For example, if many factories installed a photovoltaic system that produces green

energy, we'd have at least a 20% reduction in CO₂ emissions. Another important factor to take into consideration is the study and implementation of new ways to conserve energy in the factory.

Stan What could be done practically?

Mike To start with, the roofs of the factory facilities can be insulated, so as to improve heating and lighting.

Ben And what should be done to reduce CO₂ emissions produced by vehicles?

Mike The main aims could be: decrease vehicle mass, refine start-and-stop systems, adopt **biofuels** and make more **hybrid** vehicles. But this is what I'll try to explain in depth later. Any more questions?



(to) achieve
*ottenere,
raggiungere*

aim
obiettivo

biofuels
biocarburanti

environmental
sustainability
sostenibilità ambientale

hybrid a trazione ibrida
*(con motore a combustione
e motore elettrico)*

it's high time
è ora (+ Past simple)

renewable energies
energie rinnovabili

(to) turn to
rivolgersi a

(to) run out of
esaurire, finire

COMPREHENSION

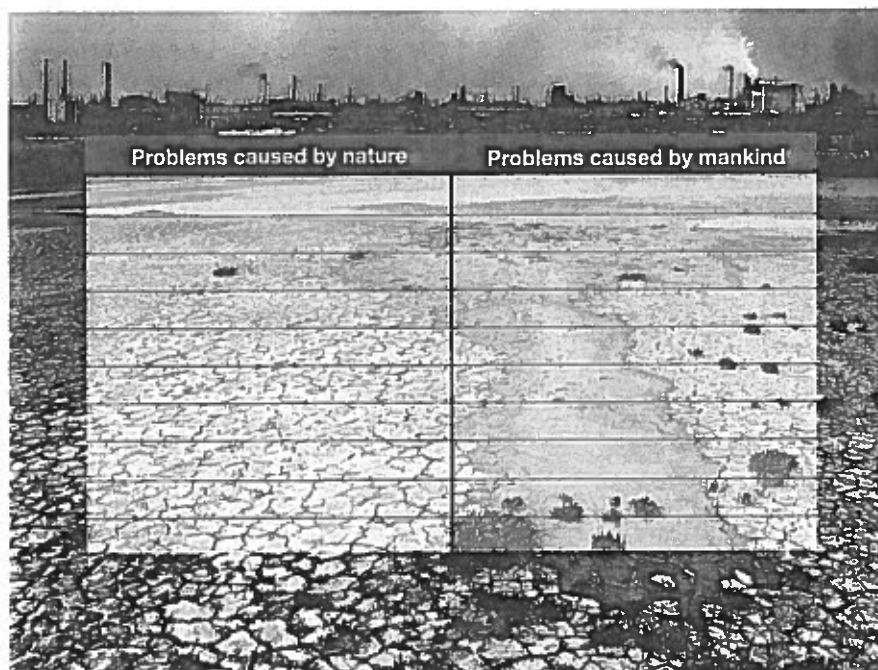
2 Read the sentences. Tick True (T) or False (F). Correct the false sentences.

- | | | | |
|---|--|-------------------------------------|--------------------------|
| 0 | Ben is attending a meeting about energy saving. | T | F |
| 1 | The CEO invited Mike Gregory to give a talk in his company. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2 | Mike hasn't worked on environmental projects for long. | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 | When the CEO got a job in the company, Mike started developing programmes about energy efficiency. | <input type="checkbox"/> | <input type="checkbox"/> |
| 4 | There's an urgent need to consider adopting renewable energies. | <input type="checkbox"/> | <input type="checkbox"/> |
| 5 | CO ₂ emissions can be reduced by making smaller cars. | <input type="checkbox"/> | <input type="checkbox"/> |

VOCABULARY & COMMUNICATION 1

The Environment

3 Which of these problems are caused by nature and which by mankind? Fill in the chart. Use the glossary at the end of the book for the words you don't know.



water pollution earthquake deforestation hurricane flood greenhouse effect wildfire
 overfishing non-biodegradable waste drought litter industrial waste avalanche landslide
 oil slick global warming blizzard volcanic eruption

4 Match the English words with their definitions.

- | | |
|--|---|
| 0 <input checked="" type="checkbox"/> overfishing | a destruction of forests and woodlands |
| 1 <input type="checkbox"/> pollution | b waste that can't be broken down |
| 2 <input type="checkbox"/> oil slick | c contamination with harmful substances |
| 3 <input type="checkbox"/> global warming | d exaggerated fishing activities |
| 4 <input type="checkbox"/> deforestation | e rubbish left in a public space |
| 5 <input type="checkbox"/> litter | f increase in the temperature of the Earth's atmosphere |
| 6 <input type="checkbox"/> non-biodegradable waste | g area of oil floating on the sea surface |

Talking about the environment

5 In pairs. Think of the place where you live. Read the sentences and choose the words which are true for you.

- 1 There *is/isn't* a *dirty/clean* river/stream/lake where people *can/can't* swim.
- 2 Some years ago *some/no* trees were planted in my *area/city* and new parks *were/weren't* opened.
- 3 There *are/aren't* many people who *drop litter on the ground/put it in the rubbish bin*.
- 4 When I was little, glass, plastic and paper was *never/sometimes* recycled in my *area/city*.
- 5 I see a *lot of/few* shoppers who use *biodegradable/non-biodegradable* bags.
- 6 In the past *a lot of/some/no* toxic waste was poured by local factories into rivers or streams.

To pour toxic waste into rivers



6 What do you know about your carbon footprint? Read the sentences. Tick True (T) or False (F). Correct the false sentences.

- 0 A carbon footprint is the amount of CO₂ produced in a year.
- 1 Greenhouse gases have nothing to do with your carbon footprint.
- 2 When we burn energy, CO₂ emissions are produced.
- 3 Carbon dioxide causes global warming.
- 4 CO₂ emissions are not produced when we fly or drive.
- 5 Planting trees can help reduce CO₂ emissions.



T	F
<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Renewable and non-renewable energies

7 Circle the words related to non-renewable energy.

water oil coal sun natural gas wind nuclear

8 Can you name these renewable energy sources from their definition?

- 1 Electromagnetic energy transmitted from solar radiations. S _ _ _ R _ N _ _ _ Y
- 2 Electricity generated by wind turbines. W _ _ _ P _ W _ _
- 3 Heat coming from hot springs and volcanic activity. G _ _ T _ _ M _ _ L _ N _ _ _ Y
- 4 Biological material from living organisms used to produce heat. B _ _ M _ _ S
- 5 Electric power converted by water falling through dams. H _ _ _ _ E _ _ _ T _ _ _ P _ W _ _

9  37 Read and listen to what your grandchild might write about the first decade of the 21st century. Do you agree with the sentences in red? Discuss with your partner.

My father told me that in my grandparents' time all buildings were heated thanks to natural gas and all vehicles were oil powered. But these fossil fuels were quickly diminishing and in 2040 the Earth ran out of oil and gas. That was a very critical period for the whole world, if we also consider that my ancestors had always fought or supported wars in the countries which produced oil. Luckily, some people had already turned to alternative sources of energy, although environmentalists were often seen as fanatics or catastrophists. Photovoltaic panels, hydroelectric power stations and wind turbines had started to catch on (*prendere piede*) before the shortage of fossil fuels, also because they didn't cause any pollution which had reached an unbearable level in 2020. Now the result is that every house is heated by the Sun, we all drive hydrogen cars or vegetable oil powered cars and there are no nuclear power stations anywhere in the world. What will the next renewable energy be like? Who knows? My grandchildren will tell me...

DIALOGUE 2

WRITING AND LISTENING

1 **38** Read the dialogue and complete it with the words in the box. Then listen and check.

consumption | commonly | pollutants | recycling | environment | materials

Gwen I'm sure you'll like this morning's presentation, Lily. I can say we had never addressed such an important issue before!

Simon Good morning. I'm Simon and I was asked to share with you my experience about textile (1) which has been done in my company for some years. Recycling is both a good way of doing business and of implementing the most **environmentally friendly** technologies available.

Gwen Do you mean that reusing or reprocessing used clothing might increase the company's profits and make us rethink about their impact on the (2) at the same time?

Simon That's for sure! Different economic and environmental benefits can be provided by recycling textiles in order not to **dispose of** them: we can **prevent** some natural fibres that decompose easily **from** producing gases that affect global warming. Moreover, some synthetic fibre products don't need to be decomposed. Lots of materials can be saved: cotton, wool and chemicals used to make synthetic fibres. Not to mention the benefits of reducing pollution and water and energy (3) I We should all tend toward a kind of ethical fashion...

Lily If I'm not mistaken, I remember a **catwalk show** that took

place in London some years ago where all the clothes had been recycled from varied (4) such as bicycle **inner tubes**, car seats and firemen's trousers.

Simon You are right! It had been one of the first eco-fashion shows ever held during a London Fashion Week!

Gwen What are the most (5) used recycling processes?

Simon When we started recycling some years ago, textiles were collected and **sorted** according to the different kinds of fibres. They didn't need to be **re-dyed** so that (6) were avoided. Then they were **shredded** into fibres, were **carded** to clean the fibres and were **spun** for **weaving** or **knitting**. It doesn't seem much has changed over the years...



(to) card <i>cardare</i>	catwalk show <i>sfilata di moda</i>	(to) dispose of <i>sbarazzarsi, gettare via</i>	(to) dye <i>tingere</i>	environmentally friendly <i>ecologico, rispettoso dell'ambiente</i>	inner tube <i>camera d'aria</i>
(to) knit <i>lavorare a maglia</i>	(to) prevent from <i>impedire di</i>	(to) shred <i>sminuzzare, stracciare</i>	(to) sort <i>smistare</i>	(to) spin <i>filare</i>	(to) weave <i>tessere</i>

COMPREHENSION

2 Answer the questions.

- 1 Why is Gwen proud and excited?
- 2 What are the two main benefits of recycling textiles?
- 3 Can only natural fibres be recycled?
- 4 How can the environment benefit from textile recycling?
- 5 List the verbs that summarize the textile recycling process.

VOCABULARY & COMMUNICATION 2

Recycling

- 3 Which of these behaviours are environmentally friendly? Underline them. Use the glossary at the end of the book if you don't know the meaning of any of them.

buying local food travelling short distances by car throwing litter on the beach
 using biodegradable bags carpooling taking magazines to a paper bank cycling to school
 buying a fur coat fixing leaking pipes converting plastic bottles into fabric



- 4 Match the words with their Italian translation.

- | | |
|---|-----------------------|
| 0 <input checked="" type="checkbox"/> to bale | a gomma espansa |
| 1 <input type="checkbox"/> to melt | b spesso, denso |
| 2 <input type="checkbox"/> foam | c serbatoio |
| 3 <input type="checkbox"/> tank | d fondere, sciogliere |
| 4 <input type="checkbox"/> tub | e imballare |
| 5 <input type="checkbox"/> thick | f vasca |

- 5 In pairs, rearrange the steps necessary to make fabric from plastic bottles. Then ask and answer questions.

- The melted plastic is spun until it turns into a thick foam.
- 1 Plastic bottles are compacted and baled.
- The foam is pushed through a tube with small openings and comes out as filaments.
- The small pieces are cleaned under high pressure hot water to remove dirt.
- Polyester is made from these recycled plastic filaments.
- Then they are melted in large tanks or tubs.
- A soft and durable fabric is made from polyester.
- Bales are shredded into small pieces.



Would you wear T-shirts from recycled plastics? Why?

Do you recycle paper, glass, plastic, tins and cans at home?

What do you do to save energy in your family?

Reading

A zero-waste year

In 2006 Colin Beavan was researching global warming when he realised his own lifestyle was contributing to the problem. So with his family he started a year-long experiment: to try and live in New York while causing as little environmental impact as possible.

A new lifestyle

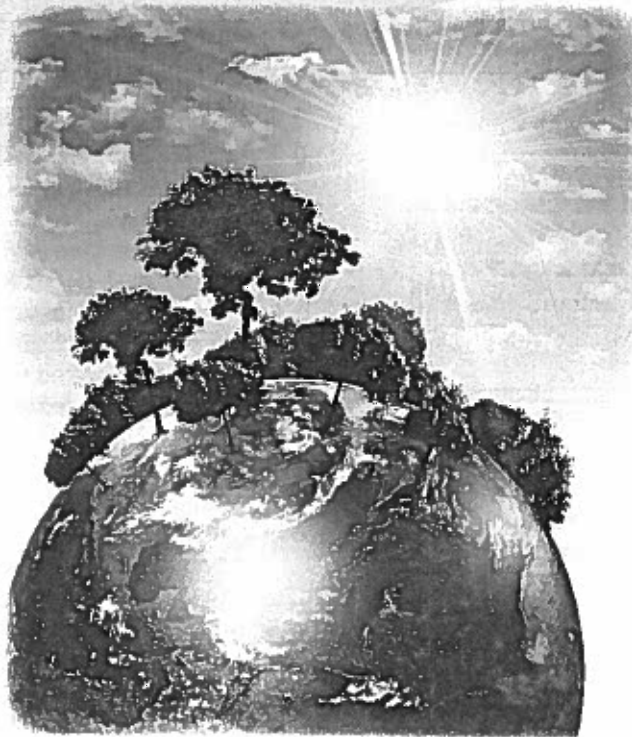
The aim of the experiment was to produce no litter. This meant avoiding all packaged food and disposable objects.

The family shopped for food exclusively at farmers' markets and used a worm bin to dispose of their organic matter. In this way, their volume of rubbish was reduced from 90 gallons a week to a cup a week.

Michelle called her husband a "1900's housewife", since he took care of the home without using most 21st century conveniences.

The whole house and all the family's clothes were cleaned using vinegar and baking soda, which the Beavans also used for their personal hygiene.

The second rule of the experiment was to use no electricity: no fridge, no microwave, and no use of the laundry machines in the basement. Instead of electric bulbs, the family had candles. The television, radiators



and air conditioning also went away. The Beavans didn't take the lift and they cycled instead of driving cars or using public transport. They only ate food grown within a certain distance from their home.

The lessons learnt

At the end of the experiment, Colin turned back to electricity. But his family has kept about 60 percent of their no-impact ways: they still don't use the freezer, a dishwasher, air

conditioning, or TV. They recycle as much as possible and avoid packaging of any sort. And they try not to buy anything new.

In total, they saved \$1,200 in electricity, and even now they spend about 20% less than the average New Yorker. But saving money was not the only benefit. They ate healthier, got more exercise and spent more time with their friends instead of watching television.

Colin is now best known as *No Impact Man* and runs a popular website on environmental matters. He is very satisfied with his experiment and hopes that people will follow his example.



1 Read the text and then choose the correct answer for each sentence.

- 0** Colin Beavan's experiment ended in
- A 2007
B 2006
C 2009
- 1** The family reduced their waste production
- A even though they didn't recycle much.
B by becoming vegetarian and growing vegetables in the flat.
C by recycling, buying local food and avoiding disposables.
- 2** In the year of the experiment the Beavans saved a lot of money
- A because they used public transport instead of driving.
B because they cut down on superfluous consumption and had no electricity.
C and consumed 20% less electricity than the average New Yorker.
- 3** The Beavans lived in an environmentalist experiment
- A in an apartment within a modern building.
B in a green area in the countryside.
C together with other families in New York.
- 4** After they had finished the experiment, the Beavans
- A continued living in New York without any electrical appliances.
B continued saving \$1,200 a year in electricity.
C chose to use electricity while limiting their waste of resources.
- 5** In the year of the experiment the Beavans
- A never left the house.
B hardly saw any friends.
C improved their social life.

Writing

- 2 This is a part of a letter you receive from your best friend. Write a letter answering your best friend's questions. Write your answer in about 100 words.**

PET

Writing
Part 3

I know you are a green person like me.
Do you think people's lifestyle in the West will be any greener in a hundred years' time?
How has your hometown changed over the years and what changes would you like to see in the future?

Speaking

- 3 Work in pairs. Give the definition of a word from the list. Your partner has to try and guess what you are talking about.**

paper bank / environmentally friendly products / rubbish man / vegan / vegetarian / organic food / junk food / litter / drought / geologist / thermal energy / renewable energy sources / global warming / greenhouse effect / rainforest / forest / nuclear plant / environmental activist / biodegradable / pollutant / toxic waste / deforestation

A: The place where paper is collected and recycled.

B: Paper bank!

BACK TO SKILLS

Reading

18 Leggi il testo e scrivi un titoletto per ognuna delle tre sezioni.



Recycling in America

1.

People in past centuries used to use materials over and over, but with the introduction of mass production many cheap goods became "disposable". During the economic recession of the early 1930s, many people couldn't afford new goods and so had to reuse what they had. Recycling, however, only became common again in the 1960s and 70s, when Americans started realising the environmental damage caused by rampant industrialisation.

2.

Recycling helps reduce the waste of resources, and, if done efficiently, also saves energy. Most importantly, it reduces the amount of trash that ends up in landfills. In the 1980s almost 150 million tons of garbage were sent to landfills in America each year. Today this figure has been reduced to just over 100 million tons.

3.

• **Paper**, which accounts for about 20% of the total rubbish in American homes, is usually soaked in hot chemicals to turn it into a fibrous substance. This is

then purified, filtered, pressed and dried.

• **Plastic**, which is not biodegradable, is first sorted into different types, filtered and baled; then it is shredded, melted and spun into a thick foam that can be turned into fibres of various sorts (polyester, nylon, etc.).

• **Glass** is recycled in two ways: sometimes bottles or jars are collected, disinfected and reused; at other times, they are sorted by colour, pulverised, filtered, melted and poured into moulds to create new objects.

• **Steel** is quite easy to recycle: it is simply melted and then used to form new sheets. All American steel contains at least 25% recycled material.

• **Aluminium**: recycling cans uses only 5% of the energy it takes to produce new ones. Over 50 billion cans are recycled in America each year.

• **Electronic equipment**: this is more difficult to recycle than other things, because the different components that must be separated often contain toxic materials (mercury, lead etc.). Over 63 million computers were discarded in America in 2007, but only 15% of these were recycled.

19 Completa l'elenco dei titoli dati con le informazioni corrette.

100 million: the tons of *rubbish that are sent to landfills in America each year.*

1930s: the years

20%: the percentage of rubbish in American homes

15%: the amount of

25%: the percentage of

63 million: the number of

150 million: the tons of

50 billion: the number of

Speaking

20 A coppie, guardate le immagini a pag. 107 e 108. Sceglietene una a testa e, dopo averle brevemente descritte al partner, esprimete idee e opinioni sui principali problemi ambientali.



Ilaria Piccioli

On the Farm

English for Agriculture



editrice san marco

1

Introduction

We live on a planet believed to be 4.5 billion years old, with millions of people covering almost all the land masses of it. But how did the planet Earth come about? According to the "Big Bang theory", the expansion of the universe began from 8 to 18 billion years ago with a violent explosion, which some scientists called Big Bang. Before this explosion, all the matter and energy in the universe were compressed to an unimaginable density. After the Big Bang all this material exploded outward forming the matter we see today. Millions of years ago, during the Paleozoic era, the seven continents formed one single super-continent, from which they later detached driven by endogenous¹ forces. But even today the Earth is still undergoing some changes: some continents, for example, are moving a few inches every year and records show that glaciers,² which were almost intact for hundreds of years, are retreating³ faster and faster since the mid-1800s. Mankind, whose origin dates back to 30,000 years ago, developed during the ages and this evolution is proved by the presence of fossils and other paleontological remains which have been collected and scientifically tested to determine their age. These fossils seem to support the theory of evolution, according to which creatures have changed over the time to suit⁴ their surroundings. This theory, which was constructed in the 19th century by the British scientist Charles Darwin, states that all plants and animals undergo changes and mutations in order to adapt to the environment in which they live. Darwin conducted extensive research into the environmental adaptation of animals and found out that these evolutionary

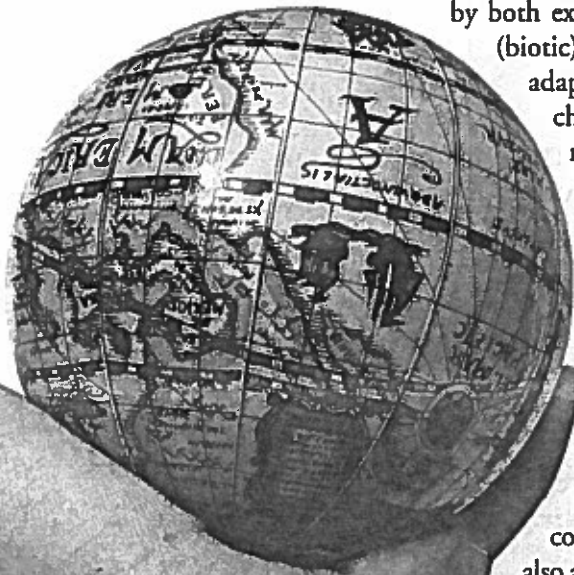
changes took place over geological times and were affected by both extrinsic (environmental) and intrinsic (biotic) factors. The more a creature could adapt to its environment the greater chance it had of living, and these natural selection pressures led to what Darwin called the 'survival of the fittest'.

Human beings, who had evolved from apes,⁵ became soon the dominant species on Earth as they are the most intelligent and enterprising of all animals, the only beings who have always had the desire to explore and understand phenomena around them.

Urged by the desire to improve his living conditions and his quality of life, man has also achieved great inventions in the field of science and technology. But man's influence has also had an impact on the habitats and the living conditions of many plants and animals. This happens because, as technology and industries become

GLOSSARY

- 1 having an internal cause or origin
- 2 masses of ice formed by snow
- 3 withdrawing
- 4 to adapt to
- 5 primates
- 6 cutting down trees for timber



more advanced, more and more of the natural resources available are being used. Among these are perpetual, renewable and non-renewable resources. Unlike perpetual resources (e.g. sunlight), which are unlimited, both renewable and non-renewable resources have a limit, but renewable resources (e.g. trees) can be replaced if they are used and produced at the same time.

Deforestation is especially present in the tropical areas because of the poor economic conditions of the countries where big rainforests are located.

The leaders of those countries sell the rights to logging⁶ companies, which use large machines such as bulldozers to cut down trees, which supply firewood and wood for the building industry. In addition to trees being destroyed, hundreds of animal or plant species are destroyed along with them. The tropical rainforests are in fact home of half of the Earth's living beings. Besides, the destruction of forests will also have serious effects on the global climate, on agriculture and on water supply.

Water scarcity will cause food scarcity, and all this will lead to high food prices, thus causing economic and political instability, especially in the developing countries.

Today, people are beginning to realize that, in the near future, the degradation of the environment will challenge our economic system and that, in order to have a sustainable development, we will have to replace our fossil-fuel-based system with a global renewable-energy-based economy.



ACTIVITIES

READING COMPREHENSION

■ Answer the following questions.

- 1 How old is the Earth?
- 2 How was it formed, according to the 'Big Bang theory'?
- 3 When did mankind first appear on Earth?
- 4 What is evolution according to Darwin?
- 5 Why did mankind become the dominant species?
- 6 How many types of natural resources are there and what are their characteristics?
- 7 Why will deforestation have such a catastrophic effect?
- 8 What can we do to foster a sustainable development?

VOCABULARY

■ Find in the text synonyms for the following words.

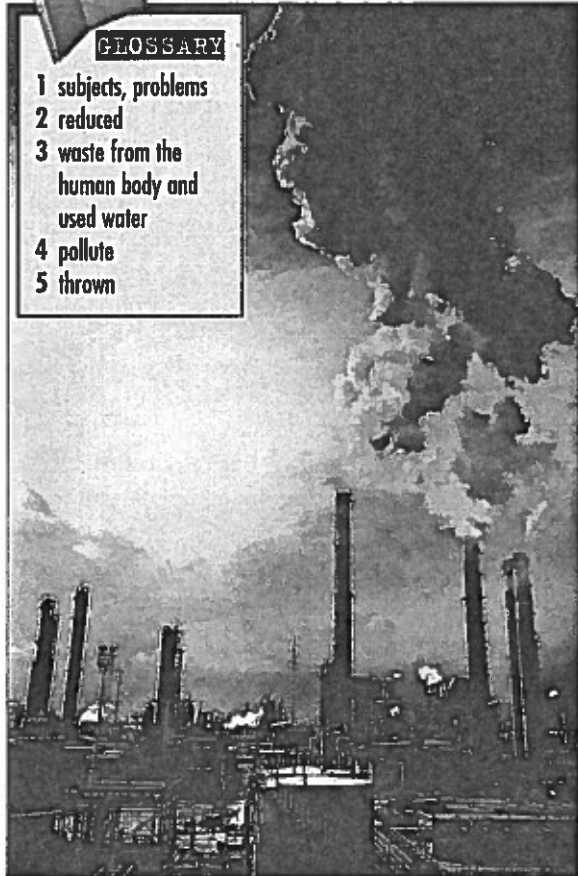
- 1 powerful
- 2 separated
- 3 gathered
- 4 discovered
- 5 possibility
- 6 kind
- 7 wish
- 8 exploited

4

The Earth's Future

GLOSSARY

- 1 subjects, problems
- 2 reduced
- 3 waste from the human body and used water
- 4 pollute
- 5 thrown



Porto Marghera, Venice.

Environmental issues¹ affect every form of life on this planet from the smallest parasite to the human race. A single disruption in the Earth's delicate balance can lead to the destruction of many species.

Human activities over the past fifty years have seriously degraded the environment.

Industrial development and population growth have polluted or over-exploited most ecosystems, from clean air to fresh water, producing what amounts to a state of emergency.

We have damaged the environment and depleted² our fossil fuels almost to nothing. Unfortunately the prevailing attitude among the nations is that economic prosperity is far more important than ecological issues. By the year 2015, many developing countries will be generating as much or more gas emissions as developed countries are now.

People create incredible amounts of waste matter in their daily lives. Not only does human sewage³ create disposal problems – dirty water, used chemicals from factories and fumes from chimneys, motor cars and aircraft poison⁴ air and water too. Massive loads of dangerous or lethal chemicals and atomic waste have been dumped⁵ into the oceans, and the rivers throughout the world act as drains, carrying a great mass of chemical and organic waste into the oceans.

Pollution is a problem that we are just beginning to try and control properly. Whether it is air pollution or water pollution, it is very dangerous to us and other forms of life around us. Conservation of the environment is not a luxury but a necessity. But what can we do to save our planet? Everybody needs to contribute to prevention and limit the amount of waste material. For this reason, conservation pressure groups (like the Friends of the Earth organization, or Greenpeace) have learnt to adopt high-visibility campaigns to get this message across.

ACTIVITIES

READING COMPREHENSION

Answer the following questions

- 1 Why is environmental conservation so important for our life?
- 2 What are the main causes of pollution?
- 3 Why are many nations still ignoring environmental issues?
- 4 What can we do to reduce pollution?

VOCABULARY

Find in the text the English equivalents of the following Italian words.

- 1 equilibrio
- 2 ciminiera
- 3 smaltimento
- 4 fognone
- 5 gruppi di pressione
- 6 esalazioni

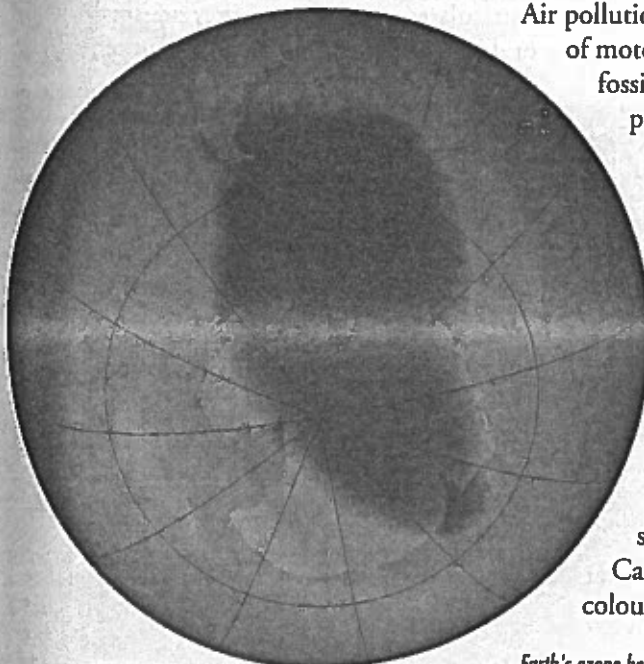
CLOZE EXERCISE

Read the following text on energy sources and fill in the blank spaces with the following words: Sun – less – geothermal – unsustainable – alternative – turbine – sources – oil.

MAIN ENERGY SOURCES

Electricity is produced by 1 generators in power stations. Turbines can be driven by different energy 2. Though our current reliance on fossil fuels is 3 in the future, clean energy sources like wind, 4 and water do not make enough economic sense to replace 5. That is the reason why many experts are starting to talk of building a hybrid economy. Rather than replacing hydrocarbons entirely, we should find ways to use 6 oil – and use it more efficiently. Among the main 7 energy sources is wind, solar energy, hydroelectric, 8 and thermoelectric.

Air Pollution 4.1



Air pollution is mainly caused by the exhaust of motor vehicles and the combustion¹ of fossil fuels. Although the amount of pollutants factories emit has reduced since the 1950s (when coal was the primary source of energy) they still release a large quantity of dangerous gases. Approximately 6.6 billion tons of harmful² substances are released in the atmosphere each year. Most air pollutants can be divided up into five categories: carbon monoxide, nitrogen oxides, hydrocarbons, sulfur oxides and suspended particulate matter. Carbon monoxide (CO), which is a colourless, odourless gas, is the most

Earth's ozone hole.

GLOSSARY

- 1 the rapid oxidation of a substance through fire
- 2 dangerous



KEYWORDS

A **pollutant** is a chemical substance, released by human beings or by nature, which can have a negative effect on our planet. Primary pollutants (carbon monoxide, nitrogen oxides, hydrocarbons, sulfur oxides, and suspended particulate matter) have a direct effect on the earth, while secondary pollutants are formed from a reaction that involves one or more primary pollutants.

The **ozone layer** is the part of the atmosphere that keeps ultraviolet rays from penetrating human beings and plants.



common air pollutant. Eighty percent of the carbon monoxide emitted by humans is caused by the harmful emissions of petrol-powered vehicles. Since automobiles are the main source of carbon monoxide pollution, the highest concentration of this gas is in highly populated urban areas.

Nitrogen oxides include three different gases: nitrogen dioxide (NO_2), nitrous oxide (N_2O), and nitric oxide (NO). Nitrogen dioxide is generally not considered a **pollutant** because it is not toxic. The increasing use of nitrogenous fertilizers is among the reasons why emissions of nitrous oxide have been on the rise. Sulfur dioxide (SO_2) is very reactant with moisture (H_2O) and forms sulfure acid (H_2SO_4), one of the substances contained in acid rain.

Hydrocarbons are the second largest category of air pollutants by mass, but they are by far the largest group of pollutants when considering their effect.

Most hydrocarbons are generated by the bacterial decomposition of organic material. Methane (CH_4) is the simplest of the hydrocarbons. Petroleum is a complicated mixture of several simple hydrocarbons.

The final category of pollutants is the suspended particulate matter, or particulates, for short. Unlike the other four categories, particulates are not gases, they are small solid or liquid particles such as smoke, mist or dust. The effect on humans is entirely in the respiratory system.

Because of all the air pollution, various chemicals are slowly destroying the **ozone layer**. Each year the concentration of the ozone decreases by approximately 2% and the ozone layer over the South Pole is already fifty percent of its natural concentration. Ozone depleters (the majority of which are chlorofluorocarbons or CFCs) react with ultraviolet radiation and break down into their component atoms, especially chlorine, bromine and fluoride. These component atoms then go on to steal an oxygen atom from the ozone layer, thereby destroying it.



READING COMPREHENSION

■ Answer the following questions.

- 1 What are the main causes of air pollution?
- 2 What is the most common air pollutant?
- 3 What are the main features of carbon monoxide?
- 4 What are hydrocarbons generated by?
- 5 What are particulates?

WRITING

Write sentences which have the same meaning as the following.

1 Air pollution is mainly caused by the exhaust of motor vehicles and the combustion of fossil fuels.

.....

2 Approximately 6.6 billion tons of harmful substances are released into the atmosphere each year.

.....

3 The increasing use of nitrogenous fertilizers is among the reasons why emissions of nitrous oxide have been on the rise.

.....

4 Because of all the air pollution, various chemicals are slowly destroying the ozone layer.

.....

Water Pollution

4.2

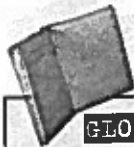
There are many polluting substances that cause disruption or change in the chemical make-up of the world's waters. Some basic pollutants include oxygen-using wastes, radioactive materials, sediments and inorganic chemicals. Other harmful substances include oil (i.e. tanker spills¹), synthetic organic compounds (i.e. pesticides²) and toxic metals (i.e. mercury).

Several different kinds of waste are oxygen consumers. There is a certain concentration of oxygen needed in the world's oceans to support life. However, waste in the water is easily broken down by the presence of oxygen, and this lowers the oxygen levels necessary to sustain the natural balance.



GLOSSARY

- 1 accidental flows of liquids over the edge of a container
- 2 chemicals used for the killing of unwanted insects or plants



GLOSSARY

3 liquid that flows off the land into rivers

Oil is made up of crude petroleum and refined petroleum products such as petrol. Crude petroleum is made up of an integral mix of compounds of hydrocarbons and refined petroleum. Oil pollution results from normal tanker operations, offshore oil productions, oil waste in sewage systems and spills. Toxic metals are made up of heavy metals, light metals, and trace metals. Trace elements end up in water systems through atmospheric rain, agricultural run-off,³ mining wastes and domestic sewage. One of the key factors of metal pollution is that they cannot biologically or chemically break down in nature.

Synthetic organic pesticides are compounds that include insecticides and fungicides. Chlorinated hydrocarbons, in particular, resist breakdown for approximately two years before they disappear.

But what are the main effects of water pollution? Drinking water may be contaminated, fish and water birds die, and the plant life on the shoreline is also affected.



ACTIVITIES

READING COMPREHENSION

Answer the following questions.

- 1 What are the main water pollutants?
- 2 What happens to oxygen if sea water is polluted?
- 3 What are the main causes of oil pollution?
- 4 Why is metal pollution so harmful?
- 5 What are synthetic organic pesticides?

VOCABULARY

Explain in your own words the meaning of the following terms.

- 1 disruption
- 2 toxic
- 3 to support
- 4 petrol
- 5 fungicides
- 6 shoreline

4.3

Deforestation

In the past few years trees have been cutting down at increasingly high rates and deforestation has become a pressing¹ issue especially because its effects can be irreversible. Fifteen million creatures live in tropical rainforests, and forests have global implication not only on life, but also on the quality of it. Trees improve the quality of air by trapping carbon and other particles produced by pollution.

According to the World Wide Forest Report at the time of the Roman Empire 90% of Europe was covered in forests. Today 500,000 hectares vanish² in a single week. But what are the main causes of deforestation? One is overpopulation in cities and developing countries. Since population is constantly growing in underdeveloped countries, people are forced to move to the forests and destroy trees to create more land for farming or cattle grazing.³ But, though small farmers play an important role, it is modern logging industry that cuts down most trees. The roads that the loggers build to access the forests and generate hydro-electric power create an easy way for many people to try to manipulate the forest resources. Other causes of deforestation include acid rain and the building of dams.



GLOSSARY

1 urgent
2 disappear
3 eating grass



KEYWORDS

Dams are built to store water for agriculture, to control flooding and to generate electricity.

Biodiversity is the variation in life forms that exists on the planet.

Erosion occurs when land becomes barren of nutrients and the soil is swept away by the elements.

Deforestation has many social and environmental consequences, such as loss of **biodiversity**, destruction of forest-based societies, and climatic disruption.

The loss of biodiversity caused by deforestation is huge. Although tropical forests cover only six percent of Earth's land surface, they happen to contain between 70% and 90% of all the world's species. As a result of deforestation we are losing between 50 and 100 animal and plant species every day.

Another problem caused by deforestation is soil **erosion**. Once forests have been cut down, essential nutrients are washed out from the soil. When there are no trees to keep the soil in place, the soil dries and cracks. If the soil temperature exceeds 25 degrees centigrades, volatile nutrient ingredients like nitrogen can be lost, further reducing the fertility of the remaining soil and making cultivation impossible. Soil erosion may also have a serious social impact, as those who live in the affected area are forced to move away to find areas they can cultivate.

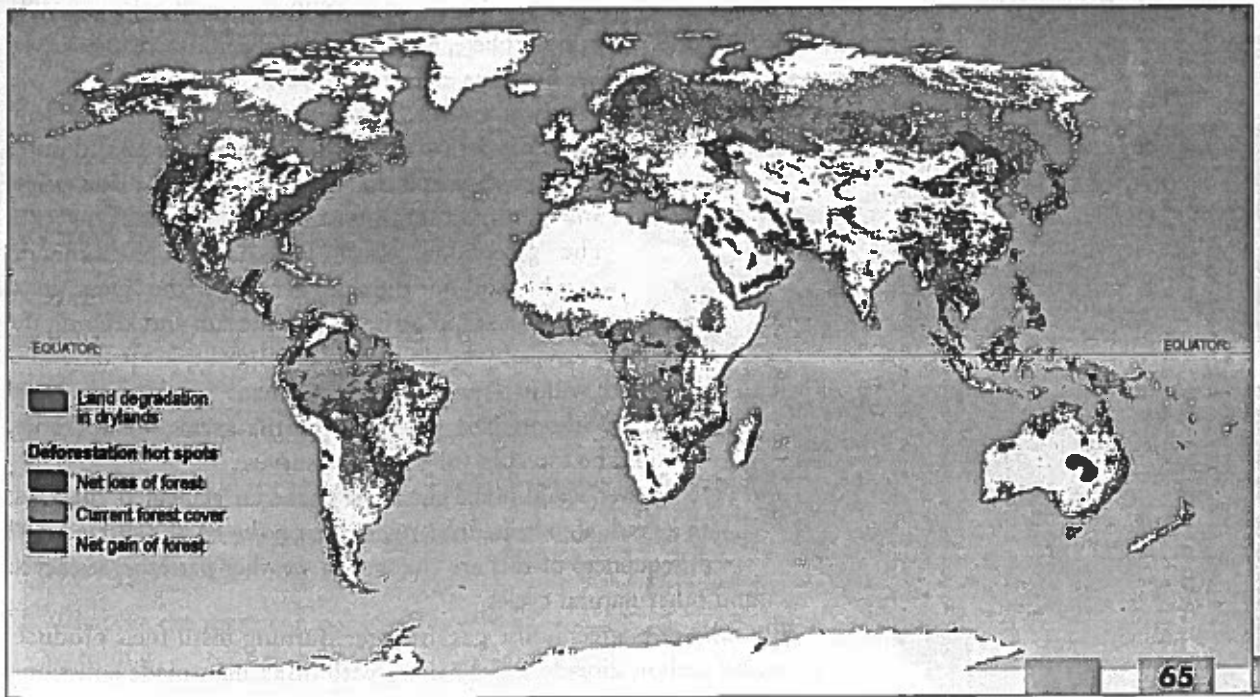
Flooding⁴ is another serious consequence of deforestation. In tropical areas where the forests are dense, flooding is not as serious a problem because there is vegetation to absorb the rainfall. However, although all long-term effects of deforestation are potentially serious, perhaps the most serious of all is that of climate change.

Forests help to maintain a delicate balance between all of nature's elements. By destroying forests we are putting this delicate balance in jeopardy.⁵ Unfortunately, there is no cure

GLOSSARY

4 a situation in which an area of land becomes covered with water, for example because of heavy rain

5 danger



for deforestation. Reforestation is not always successful because by the time the new trees grow, the soil has already lost much of the nutrients it once had.

What are the possible solutions then? One option might be decreasing the need for the amount of products that are harvested from the rainforests. For example, all countries, especially developed ones, should enforce programmes based on recycling. Another solution could be to provide aid to underdeveloped countries so that they can provide a home to those who are forced to move towards the forests.



ACTIVITIES

READING COMPREHENSION

■ Answer the following questions.

- 1 Why is deforestation such a serious problem?
- 2 What are the main causes of deforestation?
- 3 Why are tropical forests so important?
- 4 What can we do to solve the problem of deforestation?

SPEAKING

■ Explain the phenomenon of soil erosion.

VOCABULARY

■ Find in the text synonyms for the following words.

- 1 beings
- 2 inhabit
- 3 obliged
- 4 effects
- 5 places
- 6 possibility

4.4 The Greenhouse Effect

The term 'greenhouse effect' was first used in the early 1880s to describe the naturally occurring functions of gases in the atmosphere. It was not until the mid-1950s, however, that it was associated to the idea of climate change.

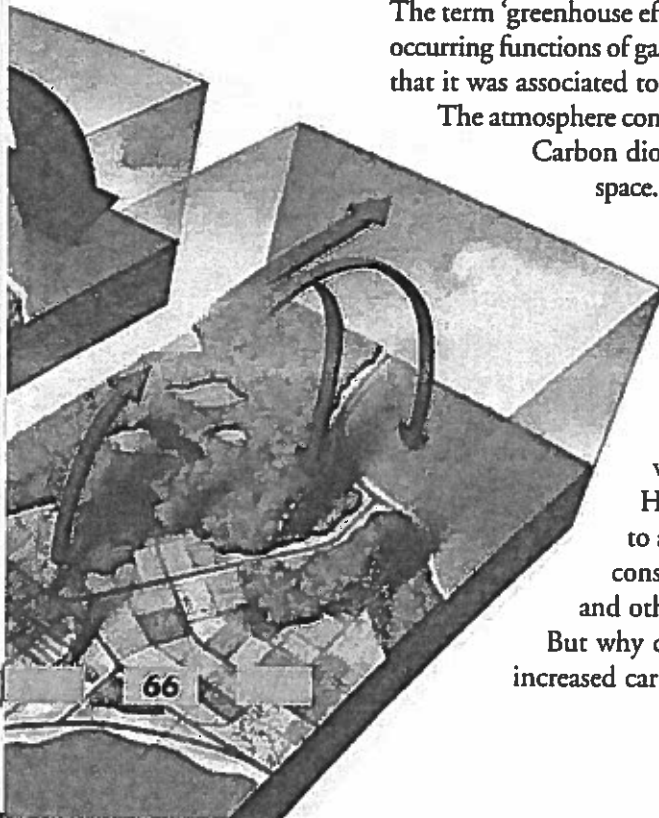
The atmosphere contains a variety of 'greenhouse gases' which ensure life on Earth.

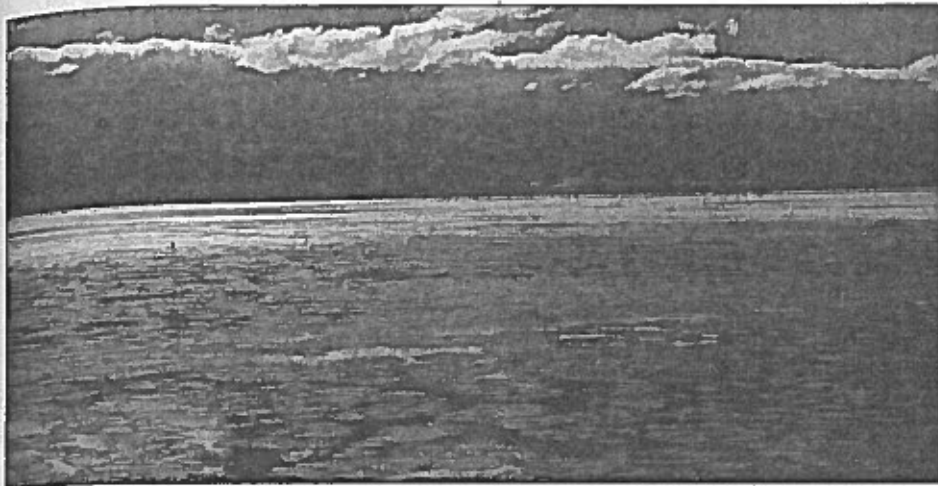
Carbon dioxide (CO₂), in particular, helps moderate heat loss to outer space. Other greenhouse gases include methane, nitrous oxide, ozone and chlorofluorocarbons.

The 'greenhouse effect' is a natural phenomenon whereby carbon dioxide acts like the glass in a greenhouse, trapping heat from the sun and keeping the Earth warm. Greenhouse gases keep the temperature on Earth within a range that suits humans, plants, and animal life. Without these gases, the Earth's average temperature would be too cold for people to survive.

However, if additional greenhouse gases are generated, this leads to a gradual increase in temperature on the Earth's surface. The consequences of this are changes in weather patterns, sea levels and other natural cycles.

But why does greenhouse gas increase? Burning fossil fuels produces increased carbon dioxide which, along with other man-made emissions,





A rising global temperature is melting polar ice, causing an increase in sea level. In this photo from the National Oceanic and Atmospheric Administration (NOAA), melting ice drifts on the Ross Sea off the coast of Antarctica.

boosts¹ the greenhouse effect, causing a rise in temperature which is known as 'global warming'. This happens because forests, most of which have been destroyed, cannot convert such a large amount of CO₂ into oxygen. The increase in carbon levels caused by deforestation inevitably leads to an increase in temperature, and eventually a change in climate and weather. The contribution of fossil fuels in this process is dominant. The possibility of long term global warming is still open to debate. According to the UN *Intergovernmental Panel on Climate Change* (IPCC) temperatures will rise up worldwide by 1.4 to 5.8 °C between 1990 and 2100, causing more extreme weather events such as hurricanes, floods and droughts. Even the oceans will become warmer and the polar icecaps will start to melt, thus disturbing the balance of nature.

UN stands for United Nations, an international organization established after World War II. Among its purposes are the maintenance of international peace, the development of friendly relations among states, and the cooperation in solving international, social, economic, and humanitarian problems. Today 191 nations are UN members.

GLOSSARY
1 increases

KEYWORDS

ACTIVITIES

READING COMPREHENSION

- Answer the following questions.
- 1 What is the original meaning of "greenhouse effect"?
 - 2 What is the function of greenhouse gases?
 - 3 What happens when greenhouse gases increase?
 - 4 Why does deforestation play such an important role in global warming?
 - 5 What are the main consequences of global warming?

VOCABULARY

- Explain in your own words the meaning of the following terms.
- 1 climate change
 - 2 ensure
 - 3 trapping
 - 4 average
 - 5 consequences
 - 6 man-made

EXTENSION

SAVE THE PLANET... STAY ON THE GROUND

Air transport is the fastest growing source of greenhouse gas emissions but has so far sparked¹ relatively little concern among governments and international bodies.

(...) Eugenio Yunis, the World's Tourism Organization's director of sustainable development admits that his organization is only now beginning a study on the environmental impact of air travel. Yunis is strident² in his defence of people's insatiable appetite to fly the world. "The important point is people's desire for mobility. The expansion of tourism demand is something that cannot be controlled – we live in a free society and the solution is not to stop people travelling or price them out of the sky with taxes. So we have to make these trips as least damaging as possible."

Like many proponents of the freedom to fly wherever we want, Yunis talks about the jets of the future being run on³ hydrogen and the airlines investing billions in newer, more efficient aircraft. But the prospect of viable alternatives to kerosene as the normal aviation fuel is probably 50 years away. And the fact that the world's aircraft fleet has doubled its fuel efficiency over the past 30 years does not make up for the fact that global air traffic has quadrupled

since 1970, from 350 billion passenger miles a year to 1,500 billion passenger miles a year.

This is forecast to more than double by 2015 and double or even triple again by 2050.

Where on earth are we going to put all those runways, planes and greenhouse gases?

(...) Air fares have fallen by 40 per cent in real terms in the past 25 years. And in Britain the mushrooming⁴ of

the low-cost airlines in the past few years has caught the public's imagination, with flights sometimes for under a tenner⁵ on the likes of Ryanair and Easyjet.

(...) But just as the bonanza⁶ is taking off, so the alarm bells start ringing. In the 1980s the car became the symbol of independence, freedom and personal mobility. Cheap, fun, cool – let's build more roads. And where did that get us? Britain's motorists are now going nowhere fast, with the worst congestion and highest car dependency in Europe.

Serious concerns about the effects of road traffic pollution on human health and global warming have shattered⁷ the illusion of car as king. Is the jumbo jet destined to go the same way in the twenty-first century?

Aviation is the source of about 13 per cent of the carbon dioxide emitted by transport and represents two per cent of all carbon dioxide

emissions from man-made sources. Jet engines give out not only carbon dioxide but also nitrogen oxides. At cruise altitude, these increase ozone concentration in the upper atmosphere, contributing significantly to the greenhouse effect. (...) Aviation has the highest growth rate of all modes of transport worldwide, and the number of passengers passing in and out of UK airports alone is forecast to double by 2020. Around 80 per cent of the world's flying is currently concentrated over Europe and America, although Asia Pacific is growing fastest. *Friends of the Earth* reports that, over short distances of less than 350 miles, air travel produces around three times more carbon dioxide per passenger than rail. High-speed long-distance electrified rail is on the up in Europe but there are still more than eight million intra-Europe flights a year, and more than 25,000 aircraft fly the skies above the UK and the Continent every day. (...)

Several green groups in Germany, the Netherlands, Austria and Scandinavia advocate⁸ self-imposed rationing, where people restrict themselves to one or

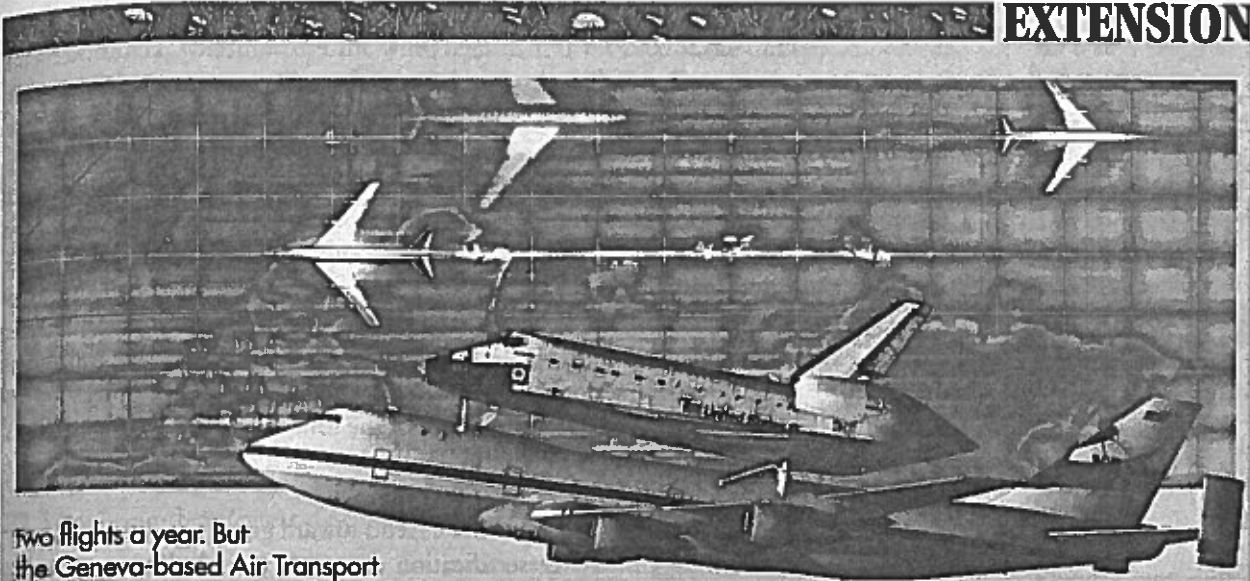


Eugenio Yunis, the World's Tourism Organization's director of sustainable development

GLOSSARY

- 1 provoked
- 2 determined
- 3 fuelled by
- 4 quick growth
- 5 ten pounds
- 6 lucky or successful situation
- 7 destroyed
- 8 propose
- 9 limitations

EXTENSION



two flights a year. But the Geneva-based Air Transport Action Group points out that global aviation generates more than £ 1,000 billion to the global economy annually. It employs four million people directly and a further 24 million indirectly – two thirds of them in Europe and North America.(...)
 Global air traffic is set to double by 2015 to 3,400 billion passenger miles annually. The number of travellers using UK airports is expected to double by 2020 to 400 million a year.
 Without curbs,⁹ aviation will produce 1.2 billion tonnes of carbon dioxide a year by 2015 – a 159 per cent increase on 1992. Emissions of nitrogen oxides from

aircraft will more than double to 4 million tonnes a year. Air fares have fallen by 40 per cent in real terms in the past 25 years. The world's planes are twice as fuel-efficient as they were 30 years ago – but the volume of air travel has quadrupled. Air travel is the fastest-growing source of greenhouse gas emissions: the average jet pumps almost one tonne of carbon dioxide into the atmosphere for every passenger it carries from London to New York.

(Adapted from *The Observer*)

READING COMPREHENSION

■ Answer the following questions.

- 1 What is the environmental impact of air travel?
- 2 What does Eugenio Yunis think?
- 3 How can we solve this problem?
- 4 Why has air traffic become one of the main sources of greenhouse gas emissions in the past few years?

ROLE PLAYING

■ Imagine you are Eugenio Yunis and explain your opinion about air traffic and greenhouse gas emissions.

VOCABULARY

■ Find in the text synonyms for the following words.

- 1 worry
- 2 harmful
- 3 cheap
- 4 drivers
- 5 traffic
- 6 aircraft

4.5 Desertification

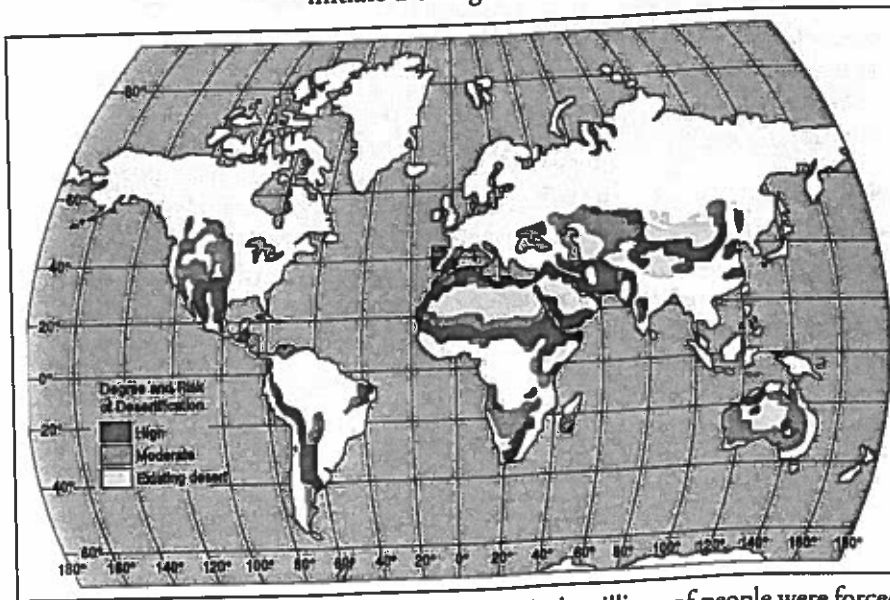
Desertification is the degradation of formerly¹ productive land. It is a complex process which involves multiple causes.

The world's great deserts were formed by natural processes interacting over long periods of time. In some regions, deserts are separated sharply from surrounding areas by mountains and other contrasting landforms, while in other areas, desert fringes² form a gradual transition from a dry to a more humid environment. These transition areas are very fragile, delicately balanced ecosystems which may be stressed beyond their tolerance limits by human activities, resulting in degradation of the land. By pounding³ the soil with their hooves, livestock compact the substrate, increase the proportion of fine material, and reduce the percolation rate of the soil, thus encouraging erosion of fine material, and reduce the percolation rate of the soil, thus encouraging erosion by wind and water. Grazing and the collection of firewood reduces or eliminates plants that help to bind⁴ the soil.

Desertification may intensify a general climate trend toward greater aridity, or it may initiate a change in local climate. Desertification does not occur in linear patterns.

Areas far from natural deserts can degrade quickly to barren soil, rock or sand through poor land management.

Unfortunately, an area undergoing desertification is brought to public attention only after the process is well under way. Desertification became well known in the 1930s, when parts of the Great Plains in the United States turned into the 'Dust Bowl' as a result of drought and poor practices in farming. However, the term 'desertification' was not used until almost 1950. During



the 'Dust Bowl' period, millions of people were forced to abandon their farms. Greatly improved methods of agriculture as well as of land and water management in the Great Plains have prevented that disaster from recurring,⁵ but desertification presently affects millions of people in almost every continent.

Increased population and livestock pressure on marginal lands have accelerated desertification. It is not true that droughts cause desertification. Well-managed lands can recover from drought when the rain returns. Continued land abuse during droughts, however, increases land degradation.

In the last 25 years, satellites have begun to provide the global monitoring necessary for improving our understanding of desertification. However, other types of remote-sensing systems, land-monitoring networks, and global databases of field observation are needed before the process and problems of desertification will be completely understood.

GLOSSARY

- 1 previously
- 2 edges
- 3 hitting
- 4 to make the soil firm
- 5 happening again

But are there any local remedies? In areas of sand dunes, covering the dunes with large boulders⁶ will interrupt the wind regime near the face of the dunes and prevent the sand from moving. Placement of straw grids will also decrease the surface wind velocity. Shrubs and trees planted within the grids may decrease the wind velocity near the base of the dune and prevent much of the sand from moving. Small plots⁷ of trees may be planted inside oases to stabilize the area. More efficient use of existing water resources and control of salinization are other effective tools for improving arid lands. New ways are being sought to use surface-water resources such as rain water harvesting or irrigating with seasonal runoff from adjacent highlands. Scientists are also studying proper crop rotation to protect fragile soils.

GLOSSARY

- 6 large round pieces of rock
- 7 small pieces of land

ACTIVITIES

READING COMPREHENSION

■ Answer the following questions.

- 1 How were the greatest deserts formed?
- 2 What are transition areas?
- 3 What is desertification?
- 4 What are the main causes of desertification?
- 5 What is the American "Dust Bowl"?
- 6 Do droughts cause desertification?
- 7 What may help researchers better to understand the desertification process?
- 8 What can we do to reduce this process?

VOCABULARY

■ Find in the text the English equivalents.

- 1 ecosistemi
- 2 aridità
- 3 in corso
- 4 bestiame
- 5 arbusti
- 6 oasi

LISTENING

■ Listen to the following item of news about Amazon drought emergency in October 2005 and then answer the questions below. Here are some key words that you will hear.

AMAZON DROUGHT EMERGENCY WIDENS

- Basin: an area that is lower at the centre than at the edges, where water runs down into a river.
 - Supplies: food, clothes, and things necessary for daily life.
 - Stranded: stuck, with no possibility to move.
 - Mud: wet earth that has become soft and sticky.
 - To counter: to prevent.
 - Threat: (here) danger
 - Airlifts: when people or supplies are taken to a place by plane.
 - To rot: to decay by a natural process
- 1 Who's helping the communities in the Amazon?
 - 2 What happened to rivers and lakes?
 - 3 What are the causes of this drought according to Greenpeace?
 - 4 What do Brazilian meteorologists think?
 - 5 Why are airlifts essential for the survival of local communities?