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Contributors

Raystede Centre for Animal Welfare.

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DO YOU KNOW THAT

one pair of natural rabbits can produce 16 Million rabbits in 6 years?

Think of Australia's problem started by only a few rabbits, now a national menace.

Too many animals are born

The answer is Speying and Neutering

They said they wanted a dog. I wonder why they wanted a dog? Now, a chair they would want to sit on; food they would want to eat; clothing to keep them warm, but why, oh! why did they want a dog?

I am the dog they selected. I just had to go on a lead to their flat.

At first, for a day, there were walkies and fusses and grooming and pats, but now in the morning the door is put open – "he wants to go out I suppose", and when I return life's lonely and flat, for all is over for 10 hours at least while they go to work and come back.

"Be good" I am told. What else can I be with chair legs and stairs just all I can see?

At night they return and say "Oh! he wants feeding". A bowl full of food is put down. I can now be let out if I want to go, and I do – Oh! I do! Yes, I do!!

"Back" they command, for TV now has started and stays on till bedtime while I doze at their feet. "Bed now" they say, and I sleep till next morning and my boredom starts over again, but why? Oh! why? Can you tell me why? Why ever they wanted a dog?

Produced by Raystede Centre for Animal Welfare, Ringmer, Nr. Lewes, East Sussex. Tel: Halland 252.

27-7-92

Too many animals are born

DO YOU KNOW THAT:-

Your **NATURAL Cat** (if unspeyed or unneutered)

CAN CAUSE

30,000 CATS to be born in **10 years**

?

Your **NATURAL Dog** (if unspeyed or unneutered)

CAN CAUSE

30,000 DOGS to be born in **10 years**

?

LASSIE . . . and . . . PUSSY were born in 1973

In August each had their first FIVE offspring in one litter (such pretty little things, no one could destroy them).

Each had two litters that year and every year of their lives

1973	9 Females	1 Male
1974	6 Females	3 Males
1975	6 Females	2 Males
1976	7 Females	3 Males
1977	5 Females	3 Males
1978	7 Females	2 Males
1979	6 Females	2 Males
1980	6 Females	2 Males
1981	9 Females	0 Males
1982	5 Females	2 Males
1983	5 Females	0 Males
1984	9 Females	2 Males

A total of 102 puppies and kittens each.

Their owners were at work all day and left both shut out.

In 12 years they were producing kittens and puppies annually.

These grew up, and their female offsprings had a total of 440 kittens and puppies each.

The male offsprings were responsible for 20,000. (A minimum – each serving 30 bitches and queens a year).

Their progeny in 12 years, not speyed or neutered produced 60,000 . . . mostly unwanted.

. . . ALL FROM LASSIE and PUSSY . . .

Of these 99% should not have been born at all because they will suffer untold misery.

Some will struggle pitifully while being drowned.

Others will find homes for a time, only to be discarded when they bite the teasing child, or are not clean in the house. Most will have at least four homes and finally end up in the hands of an animal welfare charity.

Others will be purchased at comparatively high prices, doomed to the laboratories.

Whatever befalls these animals, it is because someone has thoughtlessly kept a dog or cat unspeyed or unneutered, **AND EVERY DOG AND CAT KEPT NATURAL, WHEN YOU ARE 10 YEARS OLDER, WILL SPREAD 30,000 PUPPIES AND KITTENS AROUND THE COUNTRYSIDE,** and there are thousands of such dogs and cats capable of producing this number every 10 years – a million a year in Britain alone.

EVERY DOG AND CAT OWNER is earnestly begged to have their dog or cat suitably dealt with by a Veterinary Surgeon, and where finance is the only stumbling block, most charities are willing to be of assistance.

Too many animals have homes that are far from ideal. Some are BORED BY NEGLECT, others are CHAINED AND HAVE NO FREEDOM, others have TOO MUCH FREEDOM, AND NO TRAINING, and so Raystede protects the animal from humans who wish to own it casually and only for a short time by refusing to allow animals to go:

(a) where there are children under five;

(b) where the woman is out at work during the day and the dog or cat therefore left alone;

(c) if the home offered it is on a busy main road;

(d) if the home offered has no garden.

The new owner has to sign that in the event of being unable to keep the animal, it will be returned to Raystede and not given away, and that at any time during its life it may be visited by our official visitor.

EARTHWATCH

This wallchart is produced by the World Wildlife Fund for use in the United Kingdom, and is distributed with **People** Volume 10 Number 1 in place of the normal **Earthwatch** section as an information aid elsewhere. Subscription enquiries should be addressed to IPPF Distribution Dept. P, 18-20 Lower Regent Street, London SW1Y 4PW, England.

WORLD WILDLIFE FUND

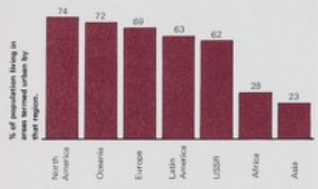
1·83 RESOURCES

Population

additional notes 1

URBAN GROWTH

In 1950 25% of all people lived in towns and cities. By 1982 the proportion was 37%. The diagram below shows the proportion of urban population by region:



Source: 1982 World Population Data Sheet

The United Nations suggest that this trend may continue and that by 2000 half the world will live in and around cities.

The pattern of human settlement varies widely from country to country. In some regions of the world, especially in developing countries, a high proportion of the population is becoming increasingly packed into a few large cities. The growth of these cities is due to natural increase but they are also swelled by people who move in from the countryside. The table shows how rapidly some cities of the Third World are expanding:-

	1960	1970	1975	2000
	populations in millions			projected
Calcutta	5.5	6.9	8.1	19.7
Mexico City	4.9	8.6	10.9	31.6
Greater Bombay	4.1	5.8	7.1	19.1
Karachi	1.8	3.3	4.5	15.9
Bogota	1.7	2.6	3.4	9.5
Lagos	0.8	1.4	2.1	9.4
Greater Cairo	3.7	5.7	6.9	16.4

Source: United Nations

Rapid city growth in developing countries has made it very difficult to provide adequate housing and services. As a result, 'uncontrolled settlements' - slums and shanty-towns - have sprung up dramatically. Sanitation and other public services are often non-existent, and there is a constant threat of disease. Already a quarter of the population of many large cities like Baghdad, Mexico City and Rio de Janeiro, live in shanty-towns, and these populations are growing faster than the cities themselves. This means, as time goes on, a larger part of the city dwellers in developing countries will be living in these unplanned shanty-towns.

Cities in the developed world also have problems. Many are expanding outward, often merging with other cities. The eastern seaboard of the USA, for example, has urban areas stretching almost continuously for 960 kilometres from Boston to Washington. Outward expansion often leaves the hearts of cities to decay: the poor are forced to congregate in these centres of broken-down houses where social services are poor and unemployment is high.

Unplanned bigger city populations leads to poor living conditions. Noise, water and air pollution is worsening and in the Third World deforestation around cities spreads as demand for fuelwood increases. Fertile farm land is often taken up as cities spread. For instance, together the USA and Canada cover 4,800 sq. km. of prime farmland under buildings, roads and reservoirs every year.

MIGRATION

Migration for work is becoming more common.

a) In the developing world, movement of workers from the countryside to the towns is often a matter of survival:
- * The use of machinery on farms reduces the number of jobs. This and the unequal distribution of land together with population growth, leads more and more landless labourers to look for work in cities.
- * In some areas soils become exhausted and enough food cannot be grown to support the people who live there.
- * In Asia and Latin America, smallholdings divided amongst sons means each has too little to survive - some heirs must forgo their land rights.
- * The chance to get work and activities like education, health services and entertainments are mostly found in cities.

The effect is rapid city growth and growing demand for housing, public services etc. while in the countryside the population still continues to increase faster than available jobs.

b) National boundaries do not stop people who want work. At present about 20 million people migrate to other countries, 12 million of these are from developing countries. This massive migration is a sign of the differences in income and employment opportunities and, to some extent, of the constraints in the flow of capital and trade between countries.

Advantages of migration

a) gains to sender countries, e.g. Mexico, Jordan, Turkey, S. Asia, Mozambique.
- * solves unemployment problems;
- * provides foreign exchange;
- * gains from training and skills of returning workers.

b) gains to receiving countries, e.g. USA, W. Europe, Middle East, S. Africa.
- * gains recruits for unpopular jobs;
- * keeps their manufacturing industries more competitive and keeps costs down in construction and service industries;
- * skilled migrants have saved training and education costs.

Disadvantages of migration
- * status of migrants is often precarious. Receiver countries control migrant numbers (e.g. length of stay) to suit their needs and sender countries have been buffeted by fluctuations in demand for migrant labour and in the money they send back home.
- * sender countries have lost skilled and semi-skilled manpower which they badly need,
- * migrant workers suffer from unequal status and poor conditions in receiving countries,
- * ethnic groups of unskilled and semi-skilled migrant workers become targets for racialism in hard times.

A Delhi shanty-town, India — Earthscan/Sanjay Acharya

additional notes 2

POPULATION DENSITY: ASIA IS OVERTAKING EUROPE

The distribution of man on the planet's surface is changing fast. Europe remains the most densely populated area of the globe, with 96 inhabitants to the square kilometre. But South and East Asia is not far behind and will soon be the most crowded region on earth. The United Nations estimates that Asia could have three times Europe's density of population within 100 years. In 1970 Asia contained 2000 million people. By the end of the century it is expected to have 3500 million.

But the rate of population growth in Asia is falling, as people choose to have smaller families. The same is not generally true in Africa, the world's fastest growing continent. Its population of 486 million will double by the early years of the 21st century. And though parts of the continent are relatively lightly populated, in some arid areas such as the Sahel or in countries such as Rwanda, the existing population is putting a strain on productive land. Latin America is also growing fast, particularly in the crowded cities, and uneven land holding is forcing poor peasants onto marginal land.

FERTILITY: SIGNS OF DECLINE IN THE DEVELOPING WORLD

The World Fertility Survey, begun in 1972, is the largest social science research project ever undertaken: it has covered 41 developing and 19 developed countries. Among the findings to emerge so far four conclusions stand out:
- * Childbearing is declining in many developing countries, though most women, even in urban areas, are having more children than those in developed countries.
- * Age at marriage is increasing in some Asian countries but changing very little in Latin America.
- * About half of all married women of reproductive age want no more children, but about half of these women do not have access to effective methods of family planning.
- * More than 80% of all married women in every country except Nepal have heard of contraception, but the percentage who have ever used contraception varies widely, from 10% in Pakistan to 82% in Costa Rica.

GOVERNMENT POPULATION POLICIES

Many governments are concerned about the economic and ecological impacts of rapid population growth. They are finding their efforts to increase saving for investment, to reduce unemployment, to provide education, to protect forests and croplands are overwhelmed by swelling human numbers. Rapid population growth is not the only cause of failure to meet development goals. However, it frequently makes things worse.

In fact, according to the International Planned Parenthood Federation (IPPF), government support for family planning is growing in every region of the world. An up-to-date count shows that 86 governments, in the world's 143 countries with populations of over a quarter of a million, actively support the provision of family planning information and services. More than three-quarters of the world's population live in these 86 countries.

However, of these 86 governments, only 35 have the reduction of population growth as one of their stated aims in providing contraceptive information and services. They include countries such as China, India, Bangladesh and Indonesia, with very large and growing populations and well established family planning programmes. Other countries such as Mexico, Kenya and Ethiopia have only recently become publicly concerned about the speed of population growth and are now more actively supporting family planning. Other countries support family planning mainly for health reasons.

In many countries private organisations work side by side with governments in providing family planning services. In some cases they step in to fill the gap when government services are not available. IPPF has member family planning associations in 117 countries which provide services, as do other privately funded agencies.

About half the 143 governments find their population trend acceptable and 23 are concerned that their fertility level is too low. This last group includes some European countries where the average family size is less than two children. As a result the total population will get smaller in at least 11 European countries.

DEVELOPMENT AND FAMILY PLANNING

Debate over the best way of bringing down soaring population growth rates was, for some time, polarised between those who emphasised two different strategies:

1. Strategy based on economic and social development: The population problem will largely take care of itself when the world's poor enjoy the fruits of development.

2. Strategy based on family planning programmes: While not denying the importance of development progress, rapid population growth is hampering that progress.

These differences are disappearing with a greater understanding that family planning is itself an essential part of social development. It is a key element in maternal and child health and makes a major contribution to the condition of women and the quality of life of the family and entire communities. At the same time family planning succeeds best when it is part of a general process of change and when delivered alongside other community activities.

FAMILY PLANNING PROGRAMMES
- * Some 300 million couples use some form of contraception, about two-thirds of them in developed countries and one-third in developing countries.
- * About 70% of couples of reproduction age in developed countries practise contraception where services are generally easily available from doctors, shops, clinics and hospitals.
- * Less than 20% of couples in developing countries use contraceptives. Many are out of reach of clinics or doctors, but various schemes have been tried to distribute services through community channels, fieldworkers, and small shop-keepers. Problems include lack of medical information and back up, discontinuity of supplies and the difficulty of reaching remote communities.
- * The most popular method is sterilization, the method chosen by one-third of all practising couples. Roughly 20% use the Pill, 15% the intrauterine device and 10% the condom.
- * Results are best in certain developing countries where more than half the couples are using contraception (China, Costa Rica, Cuba, Hong Kong, Mauritius, Panama, Singapore and Taiwan). They are worst in Africa and the Middle East, where 18 countries provide no services, and in other countries such as Pakistan and Bangladesh. The trend is positive in Latin America.

CONCLUSIONS

1. In developing national conservation strategies all countries have to take account of the number and needs of their people.
2. In many countries the rate of population growth is so great that they cannot afford to wait for future affluence to solve their population problems.
3. Such growth puts a strain on national budgets as the number of dependent young people increases. It contributes to persisting malnutrition and adds to the burden of schooling, housing, unemployment and the drift to cities. Thus poverty and rapid population growth reinforce one another.
4. There are some examples where fertility has declined in the absence of family planning programmes (often with widespread resort to abortion). There are also cases, such as Indonesia, where family planning has caught on without substantial inroads on poverty. But it is now widely agreed that the best results are obtained where social development (especially including education and improvements in the position of women) goes hand in hand with family planning. Each helps the other.

additional notes 3

MAN AND OTHER SPECIES

Planet earth is home to over 5 million species of plants and animals. But these are disappearing at the rate of at least one a day as a result of Man's activities. By the end of the century a million species may be lost for ever as their living space is destroyed.

Growing human numbers are partly to blame. Two-fifths of all species are supported by forests, which are being destroyed at an unprecedented rate. The chief reason for this is the pressure of small farmers with nowhere else to go. The rich world's appetite for timber and pastureland for meat add to the destruction of forest habitats.

The same combination of factors - the pressure of many poor farmers seeking to survive on marginal land and the pressure of rich people using up resources with the aid of powerful and often destructive technology - is threatening the survival of animals and plants everywhere.

OVERPOPULATION AMONG ANIMALS

'Overpopulation' may be defined as too many animals. But there are many different cases of 'overpopulation' and before coping with this problem, it is important to find out why an area is overpopulated and in what sense it is overpopulated. Here are some sorts of animal overpopulation:

1. Animals are seen to be overpopulated when their numbers threaten human life or livelihood.
   Examples: The World Health Organisation believes the tropics are overpopulated by the Anopheles mosquito. This creature is the carrier of malaria. Most sheepmen in Australia who have to scratch a living from drought-prone grazing land consider that the inland plains are overpopulated by kangaroos.
2. Some animals are seen to overpopulate an area when their concentrations keep down the numbers of more favoured kinds of plants and animals.
   Example: it was common practice in African national parks 30 years ago to shoot African hunting dogs. It was argued that by reducing the density of the predator dogs the density of more interesting plant-eating animals like the gazelle and dik-dik would increase.

African Hunting Dog (Lycaon pictus)
Credit: Mark Boulton

3. Some kinds of animals are too numerous for their own good. When animals have plenty of living space, they tend to be larger, fatter and healthier than when they live at the maximum density their habitat can support. Some people believe that, for their own good, animals should be hunted each year to give survivors more space for living. This is an argument used by sports hunters.
4. Overpopulation takes place when a population has risen to a level above the carrying capacity of the land and environmental damage is caused. When a population is above its equilibrium level, natural self-regulatory mechanisms come into play to restore the balance between a population and resources. With smaller creatures, like mice, the balance is re-established quite quickly - a plague one year would soon die down. Events move slowly with large mammals because of the longer generation time. Hence the population may exist at a level above the carrying capacity of the land, and environmental damage may be prevented only by culling the population.
   Example: elephant populations have probably been subjected to considerable hunting by man over many hundreds of years and their reproductive rate will have evolved to keep pace with this death factor. The creation of National Parks in Africa has reduced hunting dramatically. But it takes many years for elephant populations to adjust to this: even though the birth rate is reduced once population reaches a certain level, the parents and grandparents will continue to live so that no reduction in numbers will occur for a very long time. Consequently, several national parks are over-populated by elephants and vegetation is being destroyed as a result. Culling takes place to speed up the restoration of balance between resources and population.

UNDERPOPULATION AND EXTINCTION

a) Underpopulation

Underpopulation may be defined as too few animals. This is a problem if a population sinks so low that it requires management action to build it up again.

The crocodile of the Kabalega Falls National Park suffered from underpopulation. At one time the River Nile below the Falls swarmed with this reptile, but over the years numbers had progressively fallen. The problem was twofold: adults were being removed by poachers for their skins, and tourist launches were disturbing nesting females.

The solution to the problem was clear and simple. The poaching of adults was stopped by the prohibition of trade in crocodile skins. Previously there had been a small legal trade which had been used as an outlet for poached skins. Poaching was no longer a paying proposition and it stopped overnight.

Disturbance of females looking after their young was stopped by making the breeding areas off-limits to tourist craft during the nesting season. Already the restrictions are paying off: young crocodiles of all ages can be seen in the waters of the Nile.

b) Extinction

Sometimes a population may fall so low the plant or animal becomes extinct. Such was the fate of the passenger pigeon in North America.

The passenger pigeon's greatest claim to fame was the gigantic size of its populations: it may have been the most abundant bird ever to exist. Once Audobon, a founder of American ornithology, observed a flock passing over a period of three days at a rate of over 300 million birds an hour.

Early settlers in the United States added passenger pigeon to their diet, and as human population increased, birds were shipped by market hunters to cities like New York. Many more birds lost their nesting sites as oak and beech forests were cleared to make room for people. Pigeon numbers dropped rapidly. In 1878 one hunter shipped some 3 million birds from Michigan, the passenger pigeon's last stronghold, and the last wild bird was seen in that state just 11 years later. The last birds were not killed by hunting because this became unprofitable as soon as the great flocks were gone. When the population sizes of the pigeon became too small to maintain sufficiently large breeding colonies, nesting failure, in-breeding and death by predators must have escalated and pushed the bird to extinction.

TERRITORY HELPS CONTROL ANIMAL POPULATION

Some animals appear to control their own numbers. These are territorial animals. A territory is an area inhabited by an individual or group of animals of a given type and maintained for the more or less exclusive use of that individual or group.

The otter is usually a territorial animal. Food supply, the density of the otter population, and the habitat dictate the size of its territory. It does not tolerate the presence of other adult otters of the same sex within its territory. Even its offspring are forced eventually to leave their birthplace. The juvenile otter has to travel until it finds a suitable place which does not belong to another otter.

additional notes 4

IMMIGRATION INTO KRUGER

The size of a population in a particular region depends upon births and deaths. But it is also affected by the loss of individuals by dispersal (emigration) and the arrival of individuals from elswhere (immigration). Emigration may provide a safety valve for a population which is becoming too large for its environment to support. Immigration tends to hasten the day when a population will reach the maximum its habitat can sustain.

In Africa's Kruger National Park the effect of immigration was overlooked until it was too late.

When the Kruger Park was set up in 1905 it contained a herd of 10 elephants of all ages. Despite some poaching, the greater security afforded by the park meant the herd increased in number. By 1960 the population had reached 1,000. Some animals were lost to poachers and occasionally an elephant emigrated from the park into neighbouring farmlands. But these losses were offset by the immigration of elephants into the park from adjoining wild country.

The park managers realised the park could only support a total of 2,440 elephants: every day an elephant eats, on average, plants weighing 4% of its body weight, and so it needs 7,8 sq. km. of park to support it.

To keep numbers of elephants in the park down to a satisfactory level, immigration had to be halted and a strong fence was built to keep migrating elephants out. In addition, some park elephants had to be removed to compensate for the normal increase due to birth.

But elephants broke through fence and into the park, and in the face of increased immigration, the deliberate removal of elephants failed to keep the population at the ideal level. By 1970, the numbers of elephants in the Kruger park reached 8,000.

TOWN GROWTH HALTS PLANT GROWTH

Towns and cities are growing rapidly in most parts of the world. Urban sprawl is eating up valuable cropland and destroying the living space of many animals and plant populations.

Take the Cape Province of South Africa as an example. The number of people in that province is increasing by 60,000 each month. And as its cities expand, its plant life dwindles. Near Cape Town for instance, a valley and hillside were covered with golden gladioli. The lowland populations of this plant were smothered by alien plants introduced by a nearby dune-reclamation scheme. Housing developments covered most of the rest of the plants' habitat. Only a strip 9 metres by 36 metres remained, and this was surrounded and partly invaded by smothering shrubs from the dune project. Bulldozing for gravel almost destroyed the remaining golden gladioli. Finally came pressures from the housing development - paths, picnic sites, trampling, rubbish, and children picking the flowers.

In 1979 there were 113 gladiolus plants. A year later only 45 remained. Of these only two flowered: one was picked and dropped and the other flowered early and produced two seed pods. All the rest were seedlings poking frail leaves through the trampled earth.

The future of the golden gladiolus is dim - it relies on attempts to propagate it in 'captivity'.

Loxodonta africana - African elephant with dead trees.
Credit: Norman Myers

further reading

'How to Save the World: Strategy for World Conservation' ***Robert Allen***
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(Kogan Page edition available from World Wildlife Fund, £3.60 inc. p & p.)

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'North-South: A Programme for Survival' - The Report of the Independent Commission on International Development Issues under the Chairmanship of Willy Brandt - Pan Books Ltd., 1980.

'World Development Report' - Oxford University Press for the World Bank., 1982.

'The Mitchell Beazley Atlas of Earth's Resources' - Mitchell Beazley Publishers Ltd., 1979.

'People' - a quarterly population and development magazine, including an 8-page environment section, 'Earthwatch'. Published by the International Planned Parenthood Federation, 18-20 Lower Regent Street, London SW1Y 4PW. Annual subscription £5 (UK only) or US $15.

organisations

ORGANISATIONS

Centre of World Development Education (CWDE)
Schools Officer:
128 Buckingham Palace Road, London SW1W 9SH.
Tel: 01-730 8332/3.
An independent agency set up to promote education in Britain about development issues and Britain's inter-dependence with the Third World.
A free catalogue lists CWDE publications and visual aids.

Conservation Society Limited
12a Guildford Street, Chertsey, Surrey KT16 9BQ, England.
Tel: Chertsey (09328) 60957.
An independent organisation concerned with the size of population and the use of natural resources.
Publications include 'Conservation News'; 'Good Earth' booklets and leaflets.

Earthscan
10 Percy Street, London W1P 0DR.
Tel: 01-580 7574
A non-government media agency which produces briefing documents and booklets on a wide range of environmental issues.

Friends of the Earth (FOE)
377 City Road, London N1.
Tel: 01-837 0731.
An environmental pressure group.
Leaflet on FOE and a catalogue of FOE publications will be sent free on receipt of s.a.e.

International Planned Parenthood Federation (IPPF)
18-20 Lower Regent Street, London SW1Y 4PW.
Tel: 01-839 2911.
The largest international private voluntary organisation involved in any aspect of development, founded in Bombay in 1952 to provide an international link for family planning activities. The IPPF today works through independent family planning associations in 117 countries. Funding of about $50 million annually comes from governments and private foundations.
Publishes quarterly illustrated development magazine 'People' with environmental supplement 'Earthwatch' (annual subscription in UK: £5).

Oxfam
Education Officer:
274 Banbury Road, Oxford OX2 7DZ, England.
Tel: Oxford (0865) 56777.
A development agency spending most of its income overseas, but committed to 'development education', which is about change and development in today's world.
A catalogue on Oxfam education and youth material is available.

Population Concern
27-35 Mortimer Street, London W1N 7RJ.
Tel: 01-637 9582.
Under the auspices of the British Family Planning Association, seeks to broaden public awareness in Britain about work population issues and organises fund-raising campaigns to support population and development projects throughout the world.
Publications: 'World Population Data Sheet' 40p inc. p & p; 'Population Today' £1.50 inc. p & p; 'The Shape of Things to Come' £1.75 inc. p & p.

Population Crisis Committee and the Draper Fund
1120 19th Street, N.W., Washington D.C. 20036, USA.
Tel: (202) 659 1833.
Public information on world population problems.
Publications include 'Population Briefing Sheets'; 'Draper Fund Reports'; 'Country Status Reports'.

Population Reference Bureau
1337 Connecticut Avenue, N.W., Washington D.C. 20036, USA.
Tel: (202) 785 4664.
Private education and research organisation providing information on population issues.
Publications include: 'Population Bulletin' (reports on specific topics); 'Intercom' (international newsletter); 'Interchange' (quarterly review for population educators) and various 'Data Sheets', such as the annual 'World Population Data Sheet', with demographic data from 178 countries.

United Nations Fund for Population Activities (UNFPA)
220 East 42nd Street, New York, NY 10017, USA.
Tel: (212) 754 1234.
The principal source of funding for most population programmes implemented by the various United Nations agencies; provides over $100 million in population assistance annually.
Publishes quarterly journal 'Populi', and boxed set of data cards 'Population Facts at Hand'.

Worldwatch Institute
1776 Massachusetts Avenue, NW., Washington D.C. 20036, USA.
Tel: (202) 452 1999.
An independent research organisation created to identify and focus attention on global problems. Produces booklets (Worldwatch papers) available singly or in bulk.

World Wildlife Fund - UK
11-13 Ockford Road, Godalming, Surrey GU7 1QU, England.
Tel: Godalming (048 68) 20551.
A voluntary organisation that raises money for the conservation of threatened wildlife, habitats and natural resources throughout the world. The Fund's sister scientific body is the International Union for Conservation of Nature and Natural Resources (IUCN).
Publications list available on receipt of s.a.e. Publications include 'How to Save the World' by Robert Allen £3.60 inc. p & p; educational bulletins (6) on major habitats covering issues relevant to the 'World Conservation Strategy' 50p each inc. p & p.

Checks and balances

Today the number of people in the world exceeds 4,500 million and that figure is increasing by 200,000 every day.

The earth is not yet in danger of reaching standing room only, and the rate at which the population is growing is starting to slow down. But the strain on the earth's space and resources is apparent: pollution, overcrowding, unemployment and the scrambling for raw materials are symptoms of the relentless pressure of more people – and their growing demands.

With all animals, population growth results when more are born than die. Given good conditions – space and food for example – an animal population can multiply rapidly. The maximum rate at which an animal population can increase, if unchecked, is known as its *biotic potential*. If an animal frequently produces many offspring, its population has a high biotic potential.

In natural circumstances, few populations reach their biotic potential: various forces work towards decreasing birth rate or increasing deaths. Predators, disease, parasites and competition for food, shelter and mates add up to what is called *environmental resistance* and this is the natural check on a population.

The growth rate of any population can vary, but in animals other than humans it is not sustained. A habitat in which an animal population lives can support only a certain number of animals at any given time. The *carrying capacity* of a habitat is determined by the availability of food, cover, water and essentials of life, and it sets firm limits on an animal's population increase. The availability of resources within a habitat can change from time to time and so the carrying capacity fluctuates accordingly. No wild animal population can be maintained permanently at a level above the carrying capacity of its home: if its population continues to rise, damage to its environment follows and animals die off. Hence most animal populations over a long period of time tend to remain fairly constant.

Human population is still rising. Does this mean the carrying capacity of the planet has not been reached? If this is so, then the earth's resources – forests, grasslands, croplands, fisheries – should be able to satisfy all human needs for food, shelter and clothing.

Why then are 1,000 million people struggling to stay alive, and why are some of them irreversibly destroying the land and wildlife upon which they depend? And why do a quarter of the world's people carry on using up two-thirds of the world's resources when this is progressively making the planet less fit to live on?

What goes up, comes down

The snowshoe hare is so called because in autumn stiff brushes sprout from its feet which enable it to 'snowshoe' on speed across the winter snow.

The snowshoe hare lives in the forests of Arctic Canada. The animal population grows rapidly: litters of three or four young may be produced up to five times a year. This high birth rate means that in ten years anything up to 1,600 hares can live in a square kilometre of forest.

Lynx feed on hares, and when more hares are available, the female lynx becomes more fertile in response to a glut of food, and the number of lynxes increases rapidly.

But after plenty comes famine. The hare population suddenly crashes, for reasons which are not yet fully understood, and the highest hare year is followed by a year when their numbers drop to a fraction of the previous year. Just as a peak in the hare population is followed by a peak in lynx numbers, so the great fall in hare population is followed by a severe drop in the number of lynxes, which starve for lack of hares.

Hare numbers (and so lynx numbers) gradually build up over subsequent years, and so the cycle is repeated.

This story shows how food supply is a major limiting factor to population size. A glut of food and populations rise, a shortage of food and numbers decline. Nature is kept in a delicate balance. Interfering with that balance without understanding it can lead to disaster.

This happened to a fine herd of Rocky Mountain mule deer which lived on the Kaibab plateau of Northern Arizona, USA. This Grand Canyon country was the home, too, of many predatory animals – wolves, coyotes, bobcats. The deer competed for the range with sheep, cattle and horses.

To protect the deer population, President Theodore Roosevelt proclaimed the Kaibab region a federal game refuge in 1906. Livestock were moved out, and predatory animals were shot or trapped. With fewer competitors and natural enemies, the deer population made a spectacular increase from 4,000 to 40,000 by 1918.

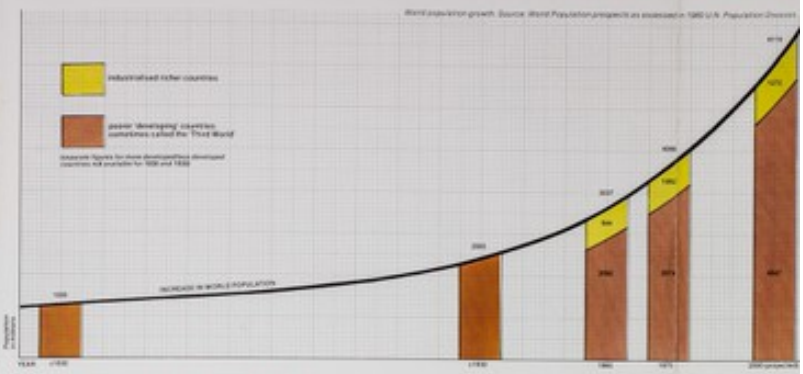
By then damage to young trees by deer was noted – a sign that the carrying capacity of the plateau had been passed. The continued increase in deer population to a peak of 100,000 in 1924 resulted in much of its food supply being destroyed. Over the following 15 years, 90,000 deer died from starvation.

Winners and losers

Herring gulls and brown rats eat almost anything and so they thrive in cities where accommodation is comfortable and the pickings – especially on refuse tips – are easy.

But other animals and plants do not fare as well when the number of people increases and towns spread. Orang-utans and *Rafflesia* are among thousands of species threatened by the loss of their forest homes. Development is increasingly endangering egg-laying sites of loggerhead turtles and the home of the wolf.

RESOURCES: Po



Galloping growth

We do not know for sure how many people are alive today, much less can we know the past numbers of people. But by careful detective work in the files of history, experts have estimated how the world's population has grown. All these estimates point to a past time when the world seemed big, people were few and population grew slowly.

Up until the late eighteenth century the numbers dying were balanced by the numbers being born. Many children failed to survive to adulthood and adults did not live long either. Epidemics – the Black Death for example – famine and war kept death rates high.

But from about 1780, the population 'took off' in Europe with incredible momentum. Technical advances in agriculture, mining and machinery laid the foundation for the Agricultural and Industrial revolutions. Transport and farming improvements meant that most Europeans were better fed than ever before. Famine was not totally eliminated but disasters were less catastrophic. Growth in industry encouraged town growth and in general along with this came a rise in living standards.

Improvements in public hygiene – the supply and purification of water, efficient sewage disposal – saved lives and helped prolong life-spans. Tremendous advances in medicine and medical services, especially for the control of mass diseases like diptheria and cholera, also reduced mortalities.

Improved living conditions reduced death rates. Population pressure built up as towns and industry grew. But the addition of New World frontiers to Europe provided a safet
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Let them eat cake

Imagine that all goods – wood, fish etc. – produced each year from the world's natural systems – forests, fisheries etc. – form the ingredients of a 'cake'. As world population grows, the 'cake' will have to expand at the same rate to give everyone the same amount each year.

But is this possible?

Improved farming technology may help production of some 'ingredients' (e.g. grain) to keep pace with demand. But trends in production of other 'ingredients', like wood, fish and beef, do not appear to be as optimistic. Under current management, forests are shrinking; more fish cannot be taken without depleting stocks; beef production costs have risen. Hence it is difficult for production to keep expanding.

If demand outstrips yield, each person's 'bite of the cake' will get smaller.

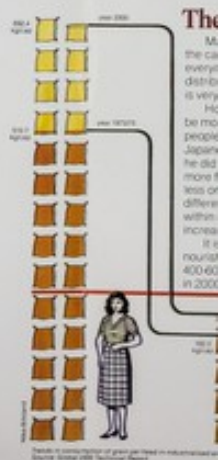
The necessities of life

Experts suggest that each person needs the equivalent of 250 kilograms of grain a year to remain healthy. If the food produced from the earth were divided equally among the world's people, everyone would have enough to eat.

In reality, however, there are great losses of food throughout the world before and after harvesting: food harvests are contaminated; eaten by animals; badly stored; poorly distributed. Moreover, everyone does not receive equal shares. Resources are unevenly distributed between people of industrialised nations and those living in less developed countries. The agricultural resources – land, water, fertiliser – required to support an average North American amount to nearly five times those needed for the average Indian, Nigerian or Colombian. An average Swiss consumes resources which would support 40 Somalis.

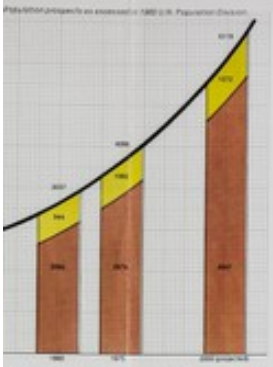
Resources are also unequally shared within less developed countries. For example, in Bangladesh 11% of the country's families own half of the land. Even within families in less developed countries, food supplies are not shared equally. If there is not enough food for the whole family, working adults tend to take the largest share – and children and pregnant mothers are the ones who suffer most.

An average Swiss consumes 40 times more resources than an average Somalian



Trends in consumption of grain per head in industrialised w
Source: Global 2000 Technical Report

ES: Population



...ical advances ...the foundation ...ons. Transport ...pel Europeans ...was not totally ...ophic. Growth in ...general along ...supply and ...posal – ...Tremendous ...es, especially ...eria and ...ath rates. ...industry grew ...Europe provided a safety valve to its increasing densities. Between 1850 and 1900 nearly 400,000 people emigrated from Europe every year; from 1900 to 1920 the exodus reached an annual peak of more than 900,000.

As industrialisation progressed, another significant population trend appeared. Birth rates in industrialised countries began to decline. No one knows the reason for certain, but a good guess is that in farming communities children were a bonus: they were extra hands on the farm. But as industry and mechanisation took over, things changed. Children were no longer potential producers but just additional mouths to feed.

A third significant population trend began in the 1940s and 1950s, this time in the less industrialised nations. A dramatic decline in death rates was caused primarily by the rapid export of modern drugs and public health measures from industrialised to less industrialised countries. Victory over malaria, yellow fever and other infectious diseases has saved lives, particularly among children and young adults.

A high birth rate, which only a few generations ago was essential to the survival of a few, now results in a rapid multiplication of people. Populations are expected to double in about 30 years as today's children, comprising two-fifths of the present population, become adults and have their own children.

Population growth is an acute problem in many of the less industrialised nations. These countries tend to lack wealth and the majority of their people are poor, with many unable to read or write. Farming tends to be inefficient: what money exists is invested mostly in city development and little is left for improving agriculture. In many countries, land is unevenly distributed and landless farmers are often forced into marginal, arid or forested areas, which are easily damaged. With deteriorating land becoming less able to support larger numbers of people, impoverished peasants flood into the overcrowded cities looking for work and a better life. Their swelling numbers pull wages down, keep rents high, shanty-towns mushroom on the outskirts of cities, and many people go hungry.

Many countries cannot properly support their populations and continued rapid population growth would mean worsening conditions at a time when people are becoming more aware of the life-styles affluent society enjoys. Frustration may build up as people become hard-pressed to maintain even their existing quality of life.

Future resource trends

Future estimates in fish and soil production per head. Source: F.A.O. © D.E. Lester Brown

Some resources – like fisheries – are being stretched close to their limits, and production seems unlikely to keep pace with population growth. (See diagram).

However, yields of other resources may be improved. Petroleum in the form of pesticides and fertilisers has increased crop yields, and mechanisation has improved farming efficiency. In future, improved farming should increase crop yields in many parts of the world.

While production of some raw materials is failing behind population, the effect is not fully realised because petroleum-based substitutes have served as a safety valve when production of natural products has not coped with demand. Petro-chemical fibres and synthetic rubber have boosted the clothing and tyre industries. Plastics have substituted wood, paper, cardboard and leather. Kerosene has been used as firewood stocks dwindle.

But oil reserves are limited (see diagram), and people are already looking again to living resources to meet their needs.

A person's 'slice of cake' seems to be getting smaller: past years of production per head of wood, fish and land, and present production per head. Source: F.A.O.

Action needed

1. **Some countries need to take urgent action to slow population growth.**

Action needed: –

- **Better education, especially for women.**
- **Improved access to health care services, including family planning services.**
- **Benefits of development to reach the poor majority.**

2. **Everyone must learn to gain a decent livelihood from the earth without undermining its capacity to go on supporting life.**

Action needed: –

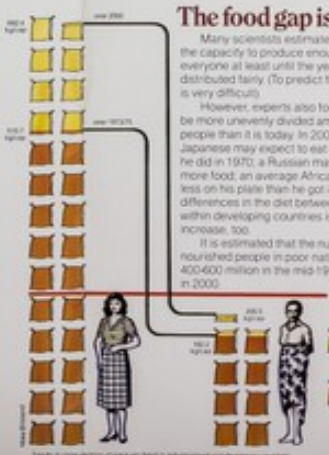
- **Conserve energy.**
- **Reduce soil loss and halt the spread of deserts.**
- **Replant forests after cutting.**
- **Protect wild plants and animals.**
- **Prevent pollution contaminating air, food and water.**

3. **Better-off countries and people who use up a high proportion of the earth's resources must be more responsible in their actions.**

Action needed: –

- **Education to increase awareness of misuse and waste of resources.**
- **Development *must* take account of the needs of people and nature as well as economic factors.**

The food gap is widening



Trends in consumption of grain per head in industrialised and developing countries. Source: Global 2000 Technical Report

Many scientists estimate that the world has the capacity to produce enough food for everyone at least until the year 2000, if food were distributed fairly. (To predict further into the future is very difficult).

However, experts also forecast that food will be more unevenly divided amongst the world's people than it is today. In 2000, an average Japanese may expect to eat over 50% more than he did in 1970; a Russian may expect over 40% more food; an average African may expect even less on his plate than he got in 1970. The differences in the diet between rich and poor within developing countries is expected to increase, too.

It is estimated that the number of under-nourished people in poor nations could rise from 400-600 million in the mid-1970s to 1,300 million in 2000.

Food is not reaching the hungry

Trends in consumption of grain per head in Western Europe. Source: Global 2000 Technical Report

Food is not scarce: it just goes to people who can afford to buy it. As farming costs rise, it will be harder for the world's poor to acquire the food they need.

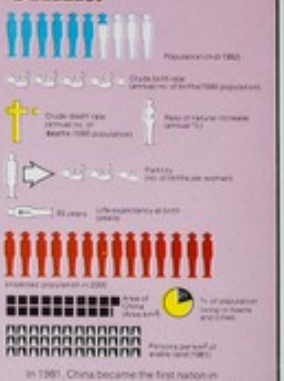
In the industrialised countries of Western Europe, people can afford to eat a lot of food. These countries do not produce enough food to meet the high demand, so grain is imported. In future, the population in Western Europe is not expected to increase much, but living standards are expected to rise. Food demand and imports will increase accordingly.

Most developing countries do not grow enough food crops to feed all their people, so grain needs to be imported. This need will grow as their population multiplies. However, some developing countries, like Thailand in South-East Asia, do export food – even when some of their people go hungry. These people cannot afford to pay food prices.

Trends in production of grain per head in South East Asia. Source: Global 2000 Technical Report

Two views on population: one firm, one relaxed

China

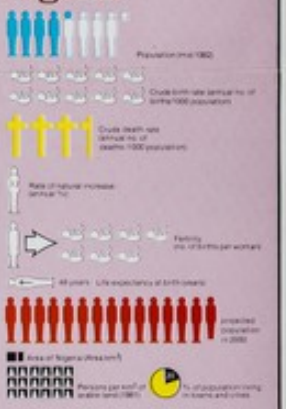


In 1981, China became the first nation in history to have a population of over 1,000 million. It is also the first country to embark on a unique and comprehensive policy aimed at a zero population growth by the year 2000.

The leadership in China has invested energy and resources in extensive family planning services linked to hospitals, workplaces and homes. One feature of the government programme is a marriage law stating the minimum age for marriage is 20 for women and 22 for men. Another feature is a system of encouraging 'one child per couple' by means of rewards and punishments. Couples with one child are given cash, housing and pension benefits, plus free education for their child. These benefits may be withheld from couples who have more children – these couples may have to make payments to the state, too.

In addition, China's policies for economic development and environmental protection are aimed at helping the country cope with present and future populations.

Nigeria



Nigerian culture values fertility and traditionally Nigerians marry young and have large families. The desire for large families is further stimulated by political rivalry – allocation of resources in Nigeria still revolves around the size of populations of its various ethnic nations.

As a result, the population is growing alarmingly fast, but, perhaps partly because of the political situation, the government has a relaxed population policy. Family planning is being included in health services, but the government feels its acceptance is a matter of individual choice.

In common with most African nations, Nigeria thinks that average family size will shrink as modernisation takes place. Nigeria's wealth of natural resources, especially oil, makes its government confident that the country can support its population while raising living standards. But the rate of population growth may be holding back social and economic development: education provision falls short of demand (two in five Nigerians are 15 or under); rural medical facilities are extremely poor; and food production is not keeping pace with population growth.

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'1:83 Resources - Population' is the first in a series of bulletins looking at world resources - their use and abuse. The series will include the following bulletins: energy; waste; land-use; pollution, and the importance of wild plants and animals.