

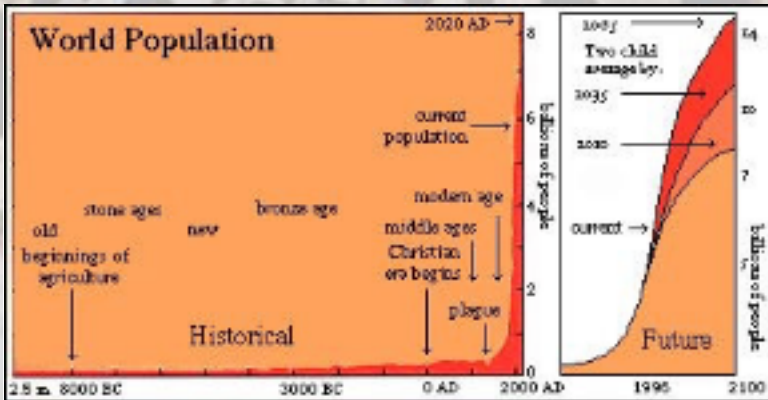
We do have viable renewable technologies but these will take massive development and are generally not so well suited to transport uses as they are to providing electrical supplies to homes. Since we cannot continue to use these non-renewable resources indefinitely, by far the best long-term investment strategy is to develop renewable energy technologies constructively now and save as much of the non-renewable resources as possible for the future to avoid a genuine chemical scarcity emerging for later civilizations. To remove in one or two generations fossil chemical reserves that have taken hundreds of millions of years to accumulate is selfish greed without parallel - an act of treason to our own forebears. The fact that an effective transition to renewable energy technologies has not yet happened shows the tragedy of the commons continues to apply to our non-renewable resources, to our folly. Humans are now utilizing a majority of the photosynthetic energy of the planet for their own purposes. The photosynthetic basis of economics is the accursed share unless we use it wisely.

### **Population Exploding**

Although world population growth is now beginning to slow as a result of social factors associated with the media, increasing education and role of women in society, the exploding population and its consequences in inevitable human impact on all aspects of the biosphere has been described as the most serious crisis ever to face the planet. Indeed Anne and Paul Ehrlich, authors of "Population, Resources and Environment" and "The Population Explosion" have described population as the issue around which all the others pivot, without which saving the environment cannot be seriously achieved:

"People can learn to treat growth as the cancer-like disease it is and move towards a sustainable society. The rich can make helping the poor an urgent goal instead of seeking more wealth and useless military advantage over one another. Then humanity might have a chance to deal with all those other seemingly intractable problems. We shouldn't delude ourselves: the population explosion will come to an end before very long. The only remaining question is whether it will be halted through the humane method of birth control, or by nature wiping out the surplus" - Anne and Paul Ehrlich (Porrirt 119). This conflict of views is illustrated by the criticism expressed by Nafis Sadik, executive director of the United Nations Population Fund, at Pope John Paul's 1996 statement that hunger is not linked to over-population, saying the world's future food needs would be inextricably linked to demographic changes. Desmond Morris has succinct comment on the role of religion (p 529).

The world's population is now about 5.9 billion and still expanding very rapidly, despite a marginal slowing in the late 1990s. Every day we share Earth and its resources with 250,000 more people than the day before; every year, there are about another 90 million mouths to feed. It is the equivalent of adding a Philadelphia to the world population every week; a Los Angeles every two weeks; a Mexico every year; and a US and Canada every three years.



Historical trends and the predicted population crisis (Wallace, King).

Though fertility rates are dropping, the sheer momentum of population growth ensures that at least another 3 billion people will be added to the planet between now and the year 2025; it could be as high as 4 billion taking it close to 10 billion total. At present growth rates, 1 billion people are added to the human ark every 11 years. There will be 6 billion mouths to feed by mid-1999. If current trends are not reversed, or at least slowed down, we could be facing a global population of close to 12 billion by the year 2100. But the problem is not population growth per se. It is that over 90 per cent of births now take place in the countries least able to cope with the resource and environmental consequences of burgeoning populations. Between now and the turn of the century, the number of people in the Third World will grow by over 900 million, or 24.6 per cent. Meanwhile the population of industrialized countries will grow by only 56 million, or 5.2 per cent.

The State of the World Population 1998 report of the United Nations Population Fund shows a slowing of population growth, but still predicts population rising to 9.8 billion by 2050. It is however not clear how well these people are going to be fed. Lester Brown, president of the Worldwatch Institute is not optimistic "both the area of cropland and the amount of irrigation water per person are shrinking, threatening to drop below the level needed to provide minimal levels of food security".

### Healing Population:

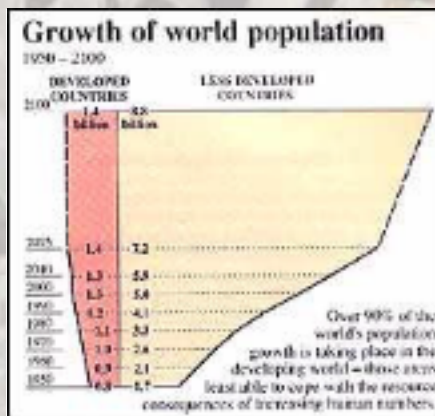
World population is a very significant factor in both poverty and hunger and in habitat destruction and loss of biodiversity. There is urgent need to realize an abatement of population growth before we all suffer the consequences severely next century. However the population problem is complicated by severe economic and energy-consumption inequities. While population growth in much of the developed world has declined or even reversed as a result of the "demographic transition" accompanying higher living standards and better education, the developing world is caught in a vicious cycle of exploitation which results

in poverty, hunger, lack of education, population growth and habitat destruction. Population cannot be addressed without addressing educational, gender, and economic inequity between the developed and developing world.

Enforced population control measures, including sterilization often act selectively against women and have also resulted in atrocious rates of female abortion and infanticide (p 211), particularly in China, India and Korea. Education, and empowerment of women are the key to informed, voluntary non-destructive population abatement.

### Proposals:

1. Population measures aimed at voluntary contraception, education of women, family-planning, empowerment of women to have autonomy over their own fertility and reproductive process, and the providing of economic circumstances in which full education and autonomy is possible.
2. Religious patriarchs should publicly rescind harmful statements encouraging population growth, such as those opposing contraception and claiming sex is solely for procreation.
3. Abortion remains a controversial issue of new medical technology, because it presents an ethical continuum. It is a matter of individual conscience which needs to be discussed further through continuing ethical debate, rather than religious edict and violent conflict. Good education, free access to contraception, responsible use and advance reproductive advice is a constructive alternative.



The vast proportion of growth will occur in the developing world

### Contraception and Population

The World Fertility Survey of 1984 revealed that many mothers in developing countries did not want any more children, but were not able to get contraceptive aids or information. Birth rates would fall heavily if all the women who said they wanted no more children actually succeeded in stopping their childbearing: the number of births would be cut by about a quarter in Africa and about a third

in Asia and Latin America. There is clearly a great unfulfilled need for family planning, but it, alone, is not enough.

Such situations are matched by other schemes in various countries from India through South Korea to Peru to institute forcible population control through sterilization or regulation. Often these measures fail, or undermine confidence in the initiative by using clandestine methods of deception to lure or entrap people into sterilization procedures without fully explaining the implications. Such population methods have been particularly suspect when applied without consent to people deemed retarded or undesirable by state eugenics programs. They also frequently result in killing or abortion of female offspring in countries where boys are prized. Leading to severe gender demographic differences, indicative of mass gendercide.

If people want to have children, even the best contraceptive is of no avail. Rapid population growth is linked to poverty, and the education of women and all must be tackled together. Family planning programs that ignore social conditions rarely succeed. "Nations as diverse as Burma, Colombia, China, Sri Lanka, Chile and Cuba - and the Indian state of Kerala - which have addressed poverty, have achieved massive declines, cutting fertility by a third to half between 1960 and 1985" (Lean 19).



Correspondence between better education of women and the fertility rate (1991 Phillips World Atlas).

The position of many religious leaders concerning contraception is little short of criminal. The Pope has emphatically declared condoms are not to be tolerated, even if a person has HIV. Cardinal Sin of the Philippines recently called condoms "only fit for animals". The position that men whether layman or pope can pass infallible judgement on the reproductive rights of women is indefensible. To enforce male fertility upon all women in the Christian dogma that all sex necessarily must result in procreation of life is a runaway form of male dominion. Significantly the rise of television dramas which portray women as independent career-seeking businesswomen and creative artists and models seems to

have had a specifically moderating impact on Brazilian population growth, despite the heavy impact of Catholic opposition. “The United Nations' own estimates suggest that as many of one-third of the pregnancies in Third World countries are either not wanted at the time or not wanted at all” (Porritt 118).

### **The Pivotal role of Women**

The status of women is crucial to solving the population problem. Women's bodies are the gateway to each new birth. It is essential that the women of the world be given the ethical freedom to make basic decisions about their own fertility. Women's education appears to be the biggest factor in reducing fertility. “In Thailand, where women have exceptional opportunities for a Third World country, a vigorous family planning program has helped cut fertility by half between 1960 and 1985. Costa Rica achieved an even greater decline, 53 per cent, over the same period; 66 per cent of its women - three times the proportion in the rest of Latin America - use contraceptives despite little effort to spread family planning. The reason seems to be that it has a good record in promoting health and education and in tackling poverty” (Lean 20).



Famine victims in Sudan 1998. The woman threshes wild grass  
Over 2 million are reported to have died in the war against the south (p 666).

### **Feeding a Peaking Population in an Over-exploited World**

As the world population grows, so more efforts are made to bring in new productive areas to feed the unsustainable human populations that are burgeoning forth. By overstressing soils and ecosystems through application of artificial fertilizers, and pesticides, many of the best productive areas of the planet are slowly being reduced to marginal lands. Some of the best regions are close to major populations and are appropriated for urban and industrial development. Lack of long-term sustainable productivity will lead to continuing crises in food production as populations crest.

On average, people in the richest developed nations eat between 30 and 40 per cent more calories than they need, while the people of the poorest nations on average get 10 per cent less than this basic minimum. There are however wide differences within developing countries. Kenyans on average get 92 per cent of what they need, but the poorest 40 per cent of the rural people suffer serious mal-

nutrition, attempting to subsist on less than three quarters of their requirements.

“Over 1 billion people - about one in every five on earth - do not get enough food to lead fully productive lives. At least 400 million of them get less than 80 per cent of their basic needs, and are condemned to stunted growth and constant danger of serious illness. Two thirds live in Asia, another fifth in Africa. Two thirds are probably under 15 years old. And their numbers are growing. Every year about 11 million children under the age of five die from hunger or hunger-related diseases. Those that survive may never reach their full potential. One third of Peru's children are so underfed that their growth is stunted. And if a child does not get enough to eat in its first years of life, its brain will not develop properly. One study followed up malnourished Indian children under five for the next 17 years of their lives - and found that their capacity for work was 30 per cent less than that of children from the same class and the same villages who had had enough to eat” (Lean 25).

People go hungry in a world that produces more than enough. They cannot get food because they are too poor to buy or grow the food they need. Increasing food production by itself does not tackle hunger. The food which is grown has to actually reach those in hunger. India is a production success story - and a consumption disaster. Its wheat harvest more than doubled under the impact of the Green Revolution between 1965 and 1972; one of the most spectacular increases in history. By the mid-1980s, it had a grain surplus of 24 billion metric tons. Nevertheless, it still has about half of all the hungry people on earth. This raises significant questions about private enterprise and the ethics of “free” financial markets. If in their own country people cannot afford to buy food, landowners divert their efforts to growing more cash crops - such as cotton, coffee, tea, sugar or tobacco - for export. Governments, saddled with huge debt burdens, will tend to encourage this to earn foreign exchange.

In 1984, 140 million Africans - more than a quarter of the continent's population - were fed with grain from overseas; though neither they nor their countries could afford to buy enough to prevent widespread hunger. Both the demand for imports and the inability to pay for enough of them will worsen over the next decades.

### **The Green Revolution, Falling harvests and Desertification**

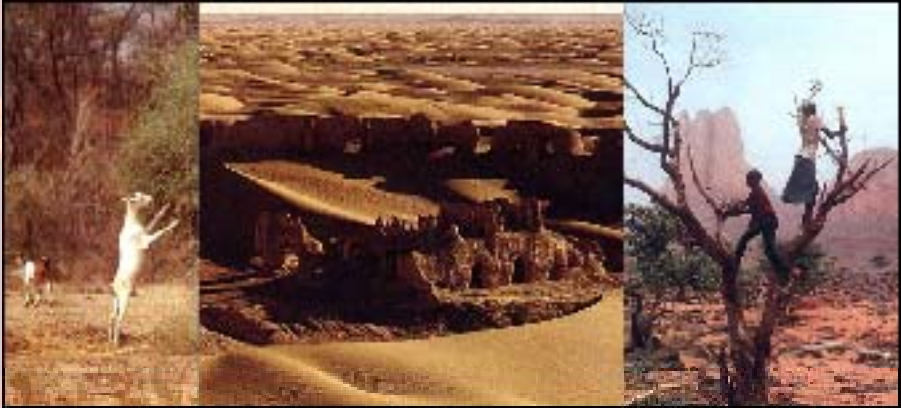
From 1945 to 1985, food production outstripped demand. The Green Revolution helped boost grain production in the Third World and technological advances improved yields in developed countries. Developed regions and Asia have greatly increased their per capita food production since the 1960s. Western Europe, where population growth has stabilized, now produces about 30 per cent more food for each of its people than in the mid-1960s. Africa has also increased its food production in absolute terms, but not enough to keep up with population growth; it now produces 27 per cent less food for each African than in 1967.

Grain production - which provides about half the world's calories - increased from around 700 million metric tons in 1950 to over 1.8 billion metric tons in 1986. It grew at around 3 per cent a year, outstripping population growth. Similarly, meat, milk and fish production rose by 2 per cent annually between 1965 and 1986, while the harvest of vegetables, pulses and fruit grew by 2.5 per cent a year. The World Commission on Environment and Development attributed the increase mainly to the development of high-yielding new seed varieties, a ninefold increase in the use of chemical fertilizers, a 32-fold rise in pesticide applications and a doubling of the world's irrigated cropland, from 135 million hectares in the 1960s to 271 million

hectares in 1985.

But this agricultural boom may be ending. In 1989, for the third successive year, the world as a whole produced too little to satisfy demand. World grain stocks fell from a record high in 1986 to approaching their lowest levels ever.

Bad weather accounts for part of the slump. Climatic conditions were almost normal in 1989; so that year's failure must have had other causes. However since these reports we have had increasingly graphic evidence of climatic disruption of production. In 1997 temperatures rose to 0.6 deg C above the norm for the 20th century and were accompanied by a large-scale El Niño oscillation.



Grazing by wild goats has contributed to major productive areas becoming desert, including ancient areas of civilization from Afghanistan to the fertile crescent. Shar-i-gholghola in the Sistan region of Afghanistan was a fertile centre until irrigation canals fell into ruin. Firewood cropping can strip remaining foliage from arid regions hastening their desertification (Ayensu, Porritt 36). This has extended the Sahara.

Another cause of falling harvests is overuse, causing erosion and desertification. Every year, the world's farmers lose about 24 billion metric tons of topsoil, about the same amount as covers the entire Australian wheatlands. At one stage, in the 1970s, American farmers lost six tons of soil for every ton of grain grown. The Food and Agriculture Organization of the United Nations (FAO) estimates that soil degradation could take 65 per cent of all the Third World's rain fed (non-irrigated) land out of production by the year 2000. And every year the world also loses 1.5 million hectares of irrigated fields to salinization. Fresh water is becoming a limiting factor which may precipitate local wars. Arable land can increase by only about 10% next century but population will go up 65%. Sufficient fresh water to 'feed' this population through improved irrigation methods is a top priority.

Pollution is also thought to be cutting yields. A US government survey suggests that ozone, may have reduced American harvests by 5-10 per cent during the 1980s. Sulfur dioxide and other nitrous oxides will also have done damage. So does the depletion of the ozone layer in the stratosphere. All these trends are likely to worsen, and population will certainly grow.

Where small farmers have been encouraged and given credit, harvests have increased and hunger fallen. Land reform is particularly important. It splits up big estates,

which are usually much less intensively farmed, and gives poor farmers and landless people the means to grow enough food to feed their families. The World Bank has estimated that such a “patchwork revolution” could increase yields even faster than the Green Revolution, with much more success in reducing hunger.

The solutions of the developed world are more high-tech, particularly the development of genetically-engineered varieties with even higher yields than the newer productive hybrids and with additional features such as pest-resistance and herbicide resistance. While these may help significantly in specific cases, the potential problems of epidemic disease of such monoclonal, the loss of wild diversity upon which new vigor depends and the release of disruptive genes into wild ecosystems and natural varieties remain little-explored problems.

### The Pollution of Gaea

“And I will give it into the hands of the strangers for a prey, and to the wicked of the earth for a spoil; and they shall **pollute** it. My face will I turn also from them, and they shall **pollute** my secret place... Destruction cometh; and they shall seek peace, and there shall be none.” Ezekiel 7:21

The actions of Saddam Hussein in setting fire to the entire Kuwaiti oil fields during the Gulf war typifies the problem of casual and reckless pollution. However this act pales into relative insignificance by comparison with the multifaceted pollution on a world-wide basis from a diverse spectrum of agents in the name of human progress.



Radioactive contamination of Europe following Chernobyl (p 198).

### Nuclear fallout and radioactive contamination

Nuclear contamination remains perhaps the most apocalyptic of pollutants to capture the human imagination. The devastation wrought on Hiroshima and Nagasaki (p 188) was however only a foretaste of the much larger amounts of