

Poverty, hunger and population policy: linking Cairo with Johannesburg

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Attitudes to population policy taken by major international institutions display a lack of symmetry. Population-based institutions forcefully set out the effects of population on development and human welfare. In contrast, institutions and lobbies concerned with hunger, poverty and environment, brought together at the 2003 World Summit on Sustainable Development in Johannesburg, treat population growth as a given, independent, variable. This paper gives a land resources viewpoint. It includes a case study of Malawi and cross-country statistical comparisons. Official estimates of the extent of spare land, cultivable but not presently cultivated, are challenged. It is concluded that in low-income, food-deficit countries population increase has reduced, in some areas nullified, advances in agricultural development. Following the 1994 UN Conference on Population and Development in Cairo, a set of ethically acceptable measures for reducing population growth received general acceptance. All concerned with poverty, hunger and environment should follow the policy road from Cairo to Johannesburg. If greater efforts are not made to reduce rates of population increase, the targets of the Millennium declaration will not be met, and the suffering which these cause will continue. Statements about agriculture, food security, poverty and sustainability should recognize that population is not an external variable but an integral part of development.

KEY WORDS: Malawi, population policy, hunger, poverty, population growth, sustainable development

Introduction

The Third UN Conference on Population and Development, held in Cairo in 1994, marked a step forward by proposing a set of ethically acceptable measures for reducing population growth. These have since received acceptance among institutions directed at population policy. In contrast, international institutions concerned with hunger, poverty and environment still treat population as an independent, 'given' variable. The international community is committed to objectives set out in the UN Millennium Declaration (UN 2000) and the World Summit on Sustainable Development held in Johannesburg (UN 2003). These objectives include halving the incidence of hunger (food insecurity) and poverty (<\$1 per day income) by some target date, variously stated as between 2015 and 2030. The greater part of this hunger and poverty occurs

in the less developed world, more particularly in its rural areas. Interim reviews show that rates of progress towards these objectives are slow, and targets will most probably not be met.

It is argued in this paper that agricultural and rural development efforts are being checked, and in some countries nullified or reversed, by the effects of population increase; and that unless greater efforts are made to reduce rates of population growth, then hunger, poverty, and the suffering which these cause will continue.

Population and development

The pendulum of opinion on the effects of population increase on human welfare has twice swung forth and back. The well-known forecast by Thomas Malthus (1798), that exponential growth in population would outrun linear growth in food

supply, was negated by the nineteenth century expansion in cultivated land. From the 1960s onward a neo-Malthusian view arose, the leading advocates being Paul Ehrlich (1968; Ehrlich and Ehrlich 1990), the 'Club of Rome' (Meadows *et al.* 1972), and more recently the Worldwatch Institute (Brown and Kane 1994; Brown annual). These authors take the view that the world is already too highly populated to sustain its limited resources, leading to food shortages, pollution, deforestation and over-exploitation of non-renewable natural resources. Clearly, population increase is central to the arguments of this lobby. After a brief flurry of concern following the 'Club of Rome' report, however, the international policy weight assigned to this view remains low. The neo-Malthusian view had academic origins, and its warnings do not command attention from the UN and leading international institutions, nor from policymakers at large. In some quarters the subject is a modern taboo: to conclude that checking population increase is essential would not be acceptable, so the question should not be discussed.

Economists have traditionally rejected the view that population increase adversely affects development, but there are signs of a shift in this attitude. In a symposium, *Population matters* (Birdsall *et al.* 2001), nineteen academics, mainly economists, put forward a view which they entitled 'revisionism', arguing that rapid population growth in developing countries has an important negative impact on economic growth, poverty, inequality, and sustainable use of natural resources; conversely, decline in human fertility makes a quantitatively relevant contribution to reducing poverty.

Most discussions on the effects of population increase on development have come from economists and demographers. The arguments set out in the present paper originate from a very different standpoint, that of a natural resource scientist, originally a soil surveyor and later working in land evaluation, land use planning, and land resource management and policy. The conclusions reached represent the outcome of more than 40 years' research in developing countries. Given the considerable unreliability of international statistics sources on land (Young 1998, 57, 211), much use will be made of the traditional geographical method of field observation.

The countries to which this paper primarily refers are the low-income food-deficit countries (LIFDCs). In non-jargon terms, this is approximately equivalent to the world's poorest countries, since almost every developing country is a net food importer. The arguments also apply to the rural areas of many newly industrialized countries, where most of their poverty exists. The population problems of developed

countries, such as ageing and congestion, are of a quite different nature and lie outside the scope of this discussion.

In the first part of this paper it is argued that, where there is high pressure of rural population on scarce land resources, as in many parts of the less developed world, continued population increase reduces or nullifies efforts at agricultural and rural development. The second part examines the leading international development policy lobbies, the policy weight which these carry, and the role which they assign to population increase. This leads to the conclusion that efforts to reduce poverty and hunger, and the suffering which these cause, will fail unless international institutions recognize that population is not an independent, or 'given', variable, but is an integral part of development.

A land resources viewpoint on population

Any traveller in many of the rural areas of developing countries will observe small farms and high population densities. Overpopulation, defined as population in excess of the capacity of land to supply its food needs, expresses itself locally in terms of farm size. If a family relies for its food on a farm of 0.2 ha, with no unused land to take into cultivation, it will go hungry in the months leading up to the next harvest, the children will have stunted growth, and there will be the ever-present danger of a famine year. Yet the average cereal harvested area in developing countries is less than 0.1 ha per capita. It is not surprising that nearly every developing country is a net importer of cereals.

The foundation of land/population studies was laid by Allen (1965), working then in northern Rhodesia (now Zambia). He estimated that 0.4 ha was the per capita requirement for subsistence maize. Under the prevailing *citemene* system (shifting cultivation in the savanna zone, with no external inputs), three years of cultivation would need to be followed by some 20 years of bush fallow to restore soil fertility, otherwise a 'spiral of degeneration' would set in. His estimates conformed to the observed average population density among the Bemba people of 4–5 km⁻².

Since then there have been many land/population studies (reviewed in Young 1998). Some, taking world population and land as the basis, have neglected the massive economic problems in the transfer of food surpluses from the developed countries, which largely produce these, to the poor countries which need them. The most detailed of these studies is the FAO population carrying capacity survey (FAO 1982 1984). The methodology employed in this was highly detailed digitization of the *Soil map of the World* (FAO–UNESCO 1970–80), an agro-climatic

assessment, and a world-scale land evaluation for 15 crops with three input levels, making allowances for soil rest periods (fallow or other), irrigation, post-harvest losses and many other factors. Taking a base year for data of 1975, the results showed which zones, and by integration which countries, would be unable to support their present and predicted future populations. At the final stage, countries with established exports (oil, minerals, etc.), enabling them to import food needs, were classified as low risk. The interest today lies in the fact that the target year was 2000. The countries assessed as 'high' and 'highest risk' show a striking similarity to those in which famines have occurred, and emergency food operations implemented, in recent years (FAO 1984, 25; World Food Program 2004; Young 2004). More recently, a Royal Society review meeting, *Land resources: on the edge of the Malthusian precipice?* (Greenland *et al.* 1998), concluded that sufficient food to feed populations of 2020 could be produced, but only through intensified research into soil, water and nutrient management, together with improved education at all levels of society.

The links between land and population will be looked at in two ways: first, by means of a case study, and second, by a review of cross-country statistical comparisons.

A case study: Malawi

The situation of a high incidence of poverty, endemic food insecurity and recurrent famine is nowhere better illustrated than in Malawi. It has enjoyed a relatively stable government and absence of civil unrest, and has been favoured by aid agencies. Yet it remains one of the world's poorest countries, with low life expectancy and high infant mortality, has 37% of the population undernourished (World Food Program 2002), and in 2001–2002 suffered the most recent of a series of famine years. In 1960 the population was 3½ million. It has since risen steadily to 12 million (2004); an apparent check during the early 1990s may be either a statistical aberration or caused by the onset of AIDS.

I first came to know Malawi (then Nyasaland) as its Soil Surveyor from 1958 to 1962. After ten visits over the intervening years, I toured the country in 1999, revisiting familiar areas (Young 1999a). The situation has become radically transformed. Although always densely populated relative to surrounding countries, the poorer land – dry, rocky or steeply sloping – was formerly under bush. Now, virtually all land that can be sustainably cultivated is being farmed, as well as substantial areas where continued cultivation will inevitably lead to land degradation. Average farm size is less than 0.4 ha, hence farmers with a family to feed are unable to escape from the

long-dominant but fertility-depleting regime of maize monoculture. Most farmers can afford little or no fertilizer. Data for average maize yields, which in recent years have ranged from 1.0 to 1.8 tonnes per hectare, hide a visible contrast between a nitrogen-starved crop yielding no more than 0.5 tonnes per hectare on unfertilized land, and small areas to which fertilizer has been applied.

In this situation the policy options for government are severely constrained (Table 1). Food aid is received in famine years, but annual handouts of food are not a recognized form of aid. Extensification, taking more land into cultivation, is an option that is now closed: the country is effectively 'full up'. Fertilizers have been given as a 'starter pack', intended to break the cycle of monoculture, but ongoing donations or a permanent subsidy encounter donor fatigue. Projects aimed at raising the current severely depleted soil fertility are currently under way, seeking to use organic inputs including agroforestry; further efforts of this kind are certainly desirable, but are made difficult by the inexorable need to meet each year's food requirement. The introduction of new export crops (at present mainly tobacco) would provide cash to farmers, but it is hard to identify a market niche.

Three further options lie outside the agricultural sector. The development of industry, accompanied by urbanization, already achieved on a small scale, could take people off the land. The domestic market, however, is limited; in a landlocked country it is difficult to find a comparative advantage, and any foreseeable development of this kind will have little impact on the rural population. Migration into the less densely populated neighbouring countries, Zambia, Tanzania and Mozambique, has been suggested, and is indeed being put into practice on a small scale by farmers near the borders; but on a scale large enough to have an impact, of the order of half a million, this would certainly not be acceptable to the governments of those countries.

This leaves the option of checking further population increase, which currently stands at 2.2% per year. Two methods of doing this, by allowing AIDS to continue unchecked, and by not making attempts to reduce the present high infant mortality, are clearly unacceptable on moral grounds. Application of the ethically acceptable package of population measures now identified, a combination of provision of family planning services, reproductive health, and improvements in the education of women, is already being practised on a limited scale, through rural clinics. The effects will inevitably be slow, extending over more than a generation. Without such checks, however, current UN projections show horrendous population figures for the future; given the current situation, the forecast

Table 1 Malawi: policy options

Policy option	Viability and problems
Food aid:	
in times of famine	Acceptable
annually	Non-sustainable
Cultivate more land	Option now closed
Fertilizer donations/subsidy:	
‘starter pack’	Success doubtful
annually	Non-sustainable, donor fatigue
Raise soil fertility	Highly desirable, hard to achieve; Synergy with fertilizer use
Introduce new crops	Hard to identify comparative advantage
Urbanization/industrialization:	
for domestic consumption	Limited by low rural purchasing power
for export	Hard to identify comparative advantage
Migration	Unacceptable to neighbouring countries
Check population increase:	
by not fighting AIDS, not checking child mortality	Ethically unacceptable
by current consensus measures: family planning, mother and child health, education and status of women	The only viable long-term solution

Source: Modified from Young (1999a)

population of 20 million by 2025 defies credibility, leading to what would amount to endemic famine.

All other measures, such as soil fertility initiatives, agricultural research, and reversing the recent reduction of development investment in the rural sector, whilst desirable in themselves, will be nullified unless accompanied by a large-scale effort to limit population growth. I am not alone in holding such a view. I visited a senior World Bank consultant living in Malawi in 1999 and asked him to amplify the basic message of his article on the country (Carr 1997). He replied, ‘What I meant was, whatever you propose in the way of aid for Malawi, don’t talk about it being sustainable, it isn’t’. Referring to a period when maize yields had been raised through a combination of hybrid and composite cultivars with subsidized fertilizer, Devereux wrote, ‘Malawi’s “green revolution” only delays the inevitable day when it becomes permanently dependent on massive inflows of aid to bridge chronic production deficits’ (1997, 1). Most remarkably, the Director of Agriculture in Colonial times, in a paper presented to the Legislative Council, ended with the observation, ‘Progress will be nullified unless Nyasaland’s present rate of growth of population is substantially reduced’ (Kettlewell 1955, 7).

Cross-country studies

Three recent cross-country comparisons bear directly on population–land–poverty linkages. Cuffaro (1997

2001) analyzed the responses of agriculture to population growth for 60 developing countries over the period 1962–92. Her starting point was to investigate whether trends in national data support the hypothesis of Boserup (1965), that farmers will intensify their agricultural practices when, and only when, circumstances force them to do so. Her data show a rise in the labour/land ratio (i.e. more population pressure on land) for 43 countries, and a rise in land productivity (output per unit area) for 56 countries, or nearly all. Thus far, population increase has been accompanied by agricultural intensification, supported by the major advances in research of the green revolution; although, in 12 countries (ten in Africa), land productivity rose less than population, a net trend towards rural hunger and poverty. However, the rise in labour productivity (agricultural production per capita at constant prices) has been much less, remaining nearly static in 12 countries and declining in five. These national averages take no account of distribution. Population growth is frequently associated with landlessness, the landless do not benefit from any rise in productivity, and the poor do not create an economic ‘demand’. Besides landlessness and a rise in income inequality, other side effects are land degradation on common land, constraints on the use of inputs (the poor cannot afford fertilizers), and ineffective application of agricultural research. She concludes, ‘In some very poor, densely populated and intensive agricultural areas, further intensification may be very

costly and the growth of effective demand too slow to provide incentives for Boserupian technological shifts' (Cuffaro 1997, 1157).

Eastwood and Lipton (1999) made cross-country regressions for the 1980s for 59 countries, 46 developing and 13 transitional, using household survey data to assess poverty, and compared this with changes in human fertility. Based on a series of regressions they concluded that, over this period, higher fertility increased poverty in two ways: by retarding economic growth and by skewing distribution against the poor. Conversely, their evidence shows that, 'Fertility declines improve distribution as well as growth, together with the likelihood of poverty-reducing feedbacks among fertility, distribution and growth'; this 'can only strengthen the case for policies to reduce national-level voluntary fertility' (1999, 23). Both effects of fertility reduction, on income growth and on distribution, are strongest in the poorest, highest-fertility countries.

Kraval (2001) made regressions of population growth rates with hunger for the period 1970–95, selecting all countries which at the start of this period had average daily food availability of less than 2800 kcal per capita. He concluded that rapid population growth inhibited improvements in per capita food availability. 'There were statistically significant negative effects of population growth on the growth . . . in total food production' (2001, 105).

Studies of this kind are a blunt instrument since many specific local factors are subsumed; they are also open to special pleading, by selecting indicators which support an hypothesis (or prejudice). Many of the least favoured countries, with reductions in agricultural production per capita and increases in poverty, have experienced political mismanagement or civil unrest. Despite such limitations, cross-country comparisons indicate two trends. First, the 'Boserup response', that the poor and hungry will take action to intensify their farming methods, no longer takes place once countries reach a condition of high rural population densities (relative to land production capacity), landlessness and poverty. Second, in the absence of major opportunities for urban migration or non-agricultural income, high human fertility and hence population growth increases poverty and, since money buys food, hunger.

Is there really spare land?

The additional food production needed to reduce present levels of hunger must come from three sources: an increase in cultivated land, higher crop yields, and/or a reduction in post-harvest losses. It is recognized that the greater part must come from

raising crop yields, although the rates of increase common during the green revolution, 2–3% per year, have now fallen close to 1% per year (Bruinsma 2003, 125). Many discussions, however, assume that a contribution will be made by substantial growth in the area of cultivated land.

This assumption is based on a series of estimates of the size of the 'land balance', land which is cultivable but not presently cultivated (Alexandratos 1995, Table A5; Fischer and Heilig 1998; Bot *et al.* 2000; FAO 2004b). These show, for developing countries in total, a cultivable area of some 2500 million ha compared with the presently cultivated area of 900 million ha. After subtracting 12% under protected land (nature reserves, etc.) and 3% under present and projected future settlements, this is reduced to a 'land balance' of 760 million ha. The existence of this supposed spare land provides a comforting thought: if all else fails, recourse can be made to the age-old solution of taking more land into cultivation.

Reasons to doubt these estimates arise from indicators widely observed in the developing world. If there is so much spare land, why has cultivation been extended onto steep slopes and extremely infertile soils, and into semi-arid zones liable to frequent crop failure? Why is there so much illegal incursion into forest reserves and national parks? Why has average farm size in some countries fallen below 1 ha, and why are infertile soils which need rest periods cropped continuously? Above all, if it were possible to move onto unoccupied land, why do 800 million people suffer from endemic undernutrition?

These estimates are based not on direct surveys of available land but on comparison of two sets of data which come from sources of a widely differing nature. The estimates of cultivable land are based on a detailed inventory based on a climatic database and a digitized version of the 1:5 million scale *Soil map of the World* (FAO–UNESCO 1970–80), linked with crop growth requirements. The figures for present cultivation, on the other hand, come from official data supplied by governments or, by default, estimated by FAO (FAO 2004a).

These official estimates have been challenged (Young 1999b 2000 2003). Reasons for the discrepancy between the estimates and field observation must lie in one or all of the following (Table 2):

- Overestimation of cultivable land.
- Underestimation of land presently cultivated.
- Insufficient allowance for demands on land for purposes other than cultivation.

Overestimation of cultivable land Detailed soil maps show numerous inclusions of uncultivable areas

Table 2 The land balance in less developed countries: a speculative reduction. For explanation see text

	Original (‘official’) (ha)	Suggested increase (+) or decrease (-) (%)	Minimum adjustment (ha)	Maximum adjustment (ha)
Cultivable	1000	-10 to -15	900	850
Less cultivated	500	+10 to +20	550	600
Gross land balance	500		350	250
Less:				
protected land	60		42	30
settlement	15		16	15
Forest, pasture, other needs	0		90	212
Total deductions	75	+10 to +25	148	257
Net land balance	425		202	nil
Net land balance as percentage of original estimate of cultivable land	42.5%		20%	nil

Source: Modified from Young (2000)

amid more fertile soils: hills, scarps, rock outcrops, minor water bodies and swamps. When surveys are reduced to smaller scales these inclusions commonly get ‘lost’, or when the only available surveys are at reconnaissance level they are ignored. In addition, the only available semi-quantitative data on land degradation, the Global Assessment of Soil Degradation (GLASOD) (Oldeman *et al.* 1990) estimates that ‘strong or extreme degradation’, effectively the irreversible loss of land, has affected some 5% of usable land in developing countries. Taking these causes together, an average reduction in the official estimates of cultivable land of 10–15% is suggested.

Underestimation of land presently cultivated Statistics on present cultivation are based on the ‘arable and permanent crops’ values given by FAO. Data on land use, however, are among the least reliable of international statistics (Young 1998, 57–60). When agricultural censuses are conducted, land use figures may be greatly revised, with such adjustments applied retrospectively to earlier years. In its study *World agriculture: towards 2010* (Alexandratos 1995), FAO itself found inconsistencies between the summed areas for individual crops and the reported total cropland, revising the latter in some cases by 25–50%; the need for international data to be ‘adjusted’ by such a magnitude speaks for itself.

These revisions and adjustments are not random but systematic in the direction of increasing the cultivated area. Reasons are first that governments do not recognize, nor report, cultivation which is not supposed to exist, such as illegal incursion onto protected land; and second that surveys of land use are infrequently undertaken, and inspection of data shows that many countries simply report the same values for up to 10 or even 20 successive years.

Underestimation of present cultivation for these reasons by 10–20% is suggested.

Insufficient allowance for demands on land for purposes other than cultivation The official estimates make allowance for protected land (12%) and settlements (3%). However, there are numerous other important uses for land. Large parts of the supposed ‘land balance’ are under pasture, conversion of which to arable would rob countries of a major source of livestock production and hence the protein element in the diet. Other large areas are for good reasons under forest, needed not only for timber production but a diversity of uses including minor forest products, soil protection, homelands for indigenous people, and strategic water catchments. Two-thirds of the ‘land balance’ is found in only 15 countries, many of which (e.g. Brazil, Congo (Democratic Republic), Indonesia, Venezuela) have large areas of tropical rain forest, further clearance of which is strongly opposed by world opinion.

I previously estimated that such under-allowance for demands on land would reduce the land balance by 10–20%. However, such is the multiplicity of uses of land other than for cultivation, and the importance of many of them to the economies and peoples of developing countries, that I now suggest that the proportion of potentially cultivable land that should be allocated to these purposes may be in excess of 25%. This is therefore the major reason for over-estimation of the land balance.

The effect of combining these three sources of error may be illustrated with reference to a hypothetical area for which the ‘official’ estimate is 1000 ha cultivable and 500 ha cultivated land (Table 2). The gross land balance is 50%, reduced after allowing for protected land and settlements to a net land balance of 42.5%. Taking the minimum

and maximum values for the adjustments suggested above, this is reduced to a net land balance of between 20% and nil. If this were to be confirmed, the effect would be that countries assessed as having a land balance of less than 50% may, in fact, have little or no remaining land that can be sustainably cultivated, whilst for countries with larger balances, the true amount of spare land may be less than half the official estimates. Reduction of land balances in this way produces results which are far more in accord with field observation. The existence of spare land, cultivable but uncultivated, could be tested directly by sample surveys, noting in particular whether such land is cultivable on a sustainable basis, and whether it is in use or needed for other essential purposes.

There has recently been recognition of the possible validity of this challenge. The major FAO review, *World agriculture: towards 2015/2030* (Bruinsma 2003, 127) repeats the earlier estimates but with the comment, 'There is also the perception, at least in some quarters, that there is no more, or very little, land to bring under cultivation', and quotes the estimates for reduction given above.

Recent data confirm that new land is not being taken into cultivation. For developing countries as a whole, there has been no increase at all in cultivated land since 1995. The total for arable plus permanent crops has remained static at 857 million ha, whilst the (slightly less unreliable) value for harvested area under cereals has fallen from a range of 439–446 million ha for 1996–99 to one of 424–436 million ha for 2000–2002. The cropland area per capita has decreased every year since 1990, whilst the cereal area harvested fell below 0.1 ha per capita in 1997 and has recently dropped, almost certainly irreversibly, below 0.09 ha per capita (Figure 1). There can be no clearer confirmation of

what is shown by field observation than for the cultivated area to remain static where endemic undernutrition prevails. The solution to hunger in the developing world cannot come from taking more land into cultivation.

Interim conclusion: effects of population increase on development

A similar situation to that described for Malawi is found, for example, in Afghanistan, Ethiopia, Haiti, Rwanda and Somalia, where food shortages have been complicated by the occurrence of severe political instability and civil unrest. It is likely, indeed, that poverty and hunger have been a factor in such unrest (Young 1998, 270). Rural areas of Kenya, notably the densely populated Western, Nyanza and Central Provinces, have small farms and no spare land, and real income per capita has declined since 1980. The terrible famines in Ethiopia in the 1980s will happen again, hopefully with an improved national relief service. In Sierra Leone, an Agricultural Officer during the 1950s made a recent return visit, reporting how a threefold increase in population has led to widespread replacement of former bush fallow by short-term scrub and grassland, concluding that, 'The over-riding constraint to the improvement of the standard of living for billions of people in the Developing World... is the persistent yearly increase in rural population' (MacDonald 2003, 22). Food insecurity is endemic in much of the African semi-arid zone.

More generally, the constraint to development brought about by population exceeding food production capacity is applicable to rural areas in most of the world's 75 LIFDCs, more particularly the least developed (i.e. poorest) among them, currently 49 countries of which 33 are in Africa. An interim review five years after the 1996 World Food Summit concluded that progress towards meeting the target of halving the number of hungry people by 2015/30 was (with the major exception of China) clearly behind schedule (FAO 2002). The World Food Program currently lists 35 countries with Emergency Operations (EMOPs), of which 25 are in Africa and six in Asia (World Food Program 2004).

The situation of South Asia is distinctive. The Indian subcontinent in the nineteenth and early twentieth centuries experienced recurrent famines, with deaths probably in excess of 20 million, the last being the Bengal famine of 1943–44. Since independence, there has been endemic hunger on a massive scale: FAO estimates for undernourishment are 275 million for India, Pakistan and Bangladesh combined. Relatively efficient national food relief measures, however, have prevented natural disasters

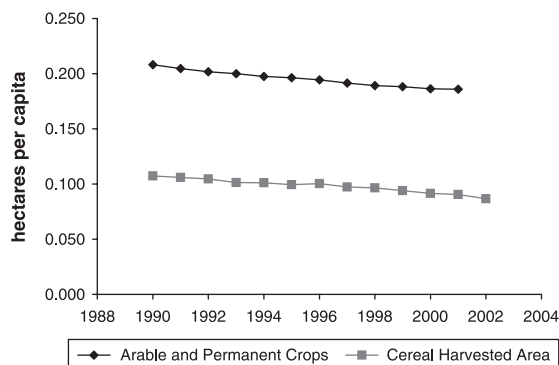


Figure 1 Land use and cereal area per capita, all less developed countries

Source: FAO statistics

Table 3 Policy weight and the role of population in major international lobbies

Lobby	Policy weight	Role of population
Neo-Malthusian (academic)	Remains low	High, central to the argument
Environment	High since 1972	Treated as a given, independent variable
Hunger, famine, food security	Low to about 1990, high since 1996	Treated as a given, independent variable
Poverty reduction	High since 1990s	Not explicit
Land degradation	Low, except as an element in sustainability	Population pressure on land recognized as a causal element
Sustainable development	High	Treated as a background, or given, independent, variable
Population	Currently low	Focal, influencing environment, hunger and poverty

(drought, flood) from leading to famine, in the sense of large-scale deaths from starvation.

From 45 years of field observation and study I am inescapably driven to the conclusion that in poor, predominantly agricultural countries with little or no spare land, population increase has reduced, nullified or reversed advances in rural development. For such countries, reduction in population growth, although long-term in its effects, is the only sustainable way to prevent the continuance, and in some countries increase, in poverty and hunger. Population policy is neither a 'given' background nor an associated factor, but is an integral part of land resource management (Young 1998, 254).

International development policy lobbies

The above interim conclusion, that checking further population increase is fundamental in attempts to reduce hunger and poverty, may be examined with respect to some major international policy lobbies (institutions and interests). For each, two questions will be asked:

- What is the policy weight of the lobby?
- What role does it assign to population?

Policy weight refers to the influence exerted on international and national political and development institutions. The role assigned to population refers to the degree to which each lobby considers population increase to be an influence on attainment of its objectives. Conclusions for each lobby are summarized in Table 3.

Environment

The origin of the environment lobby can be assigned to the 1972 UN Conference on the Human Environment (the Stockholm Conference), leading to the establishment of the UN Environment

Programme (UNEP). The early focus was on pollution, with more recent emphasis on the effects of global warming. After early neglect, environmental concern became linked with the productive aspects of natural resources at the 1992 UN Conference of Environment and Development, as set out in its agenda for the twenty-first century, *Agenda 21* (UNCED 1992). The policy influence of this lobby is high: bring 'environment' into a discussion and it will carry weight. The role assigned to population increase, however, is that of an independent variable, taking the UN estimates for future population as a 'given' factor. One does not find the argument that checking population growth is essential to the reduction of environmental ills. In *Global environment outlook 3* (UNEP 2002), projected population increases are described under 'socio-economic background', a phrase which speaks for itself.

Hunger, famine, food security

The advances in agricultural production brought about during the 'green revolution' meant that international concern with hunger, famine and food security remained modest from the post-Second World War years through to the early 1990s. This was the golden age of agricultural research; it seemed as if hunger could be conquered by science. The continuing existence of some 800 million undernourished people was brought to world attention at the 1996 World Food Summit (FAO 1996). The target announced at this Summit, to halve the number of hungry people by 2030, has since been adopted by the International Food Policy Research Institute (IFPRI) and the UN in general (with a target date of 2015).

It is hard to assign a policy weight to the hunger lobby. It is strong on statements of intent, but action, in the form of investment in agriculture and the rural sector, is lower than formerly. With respect to

the role of population, IFPRI's 2020 Vision programme serves as an example. A summary lists nine 'driving forces' and seven 'pro-poor action areas' held to be critical to improvement in food security; these do not include, neither directly nor indirectly, population increase (IFPRI 2002). In the proceedings of a major IFPRI conference with the subtitle, 'perspectives on overcoming hunger, poverty, and environmental degradation', only nine pages out of 275 discuss population policy options (Pinstруп-Andersen and Pandya-Lorch 2001).

Poverty reduction

Poverty came to the forefront of international policy through World Bank initiatives during the 1990s, when poverty reduction became a major criterion for project evaluation. It has since become a leading objective of the World Bank Group. Poverty is defined most simply as an income of <\$1 per head per day; more refined definitions, based on ability to meet basic human needs, have been formulated. The number of people on '\$1 a day' is variously estimated as 1.0–1.2 billion, and the international policy objective is to halve this number by 2030. Poverty reduction is now a major international objective with high policy weight, as indicated by the title of the current World Bank publicity brochure, *Working for a world free of poverty*. This same document illustrates that population growth is seen as a background variable: 'The challenge of reducing these levels of poverty, while the world's population continues to grow – by an estimated 3 billion people over the next 50 years – is enormous' (World Bank 2003, 1).

Land degradation

Formerly treated mainly as soil erosion, land degradation now encompasses all forms of soil degradation (Oldeman *et al.* 1990) and in some instances also degradation of vegetation (forest clearance, pasture degradation). 'Desertification' came to wider attention following the first UN Conference on Desertification in 1977, but lost credibility through exaggerated and unsupported claims (the UN now defines desertification as land degradation in drylands). Land degradation has never been a strong international lobby, in part owing to the continuing difficulty in quantitative measurement of degradation; the current FAO project on Land Degradation Assessment in Drylands (LADA) has yet to show appreciable scientific achievements (FAO 2004c). Pressure on land caused by population increase is recognized as an element in the causal network leading to degradation (Young 1994; 1998, 129; Myers 1998).

Links, combined aims, and sustainable development

Environment, food security, poverty, and land degradation were brought together in three major international documents: *Agenda 21* (UNCED 1992), the *UN Millennium declaration* (UN 2000), and the *Plan of implementation of the World Summit on Sustainable Development* (UN 2003). *Agenda 21* is one of the most balanced and cogently argued of all international documents. As compared with the Stockholm meeting 20 years earlier which focused on pollution, *Agenda 21* gives equal place to development, and hence to the environment as a productive resource. This meeting also drew wider attention to the concept of sustainable development, in particular, the conservation of natural resources for use by future generations. The *Millennium declaration* listed nine Millennium Goals, the first of which was 'Eradicate extreme poverty and hunger' and the seventh, 'Ensure environmental sustainability' (UN 2000 2004). The World Summit on Sustainable Development (Johannesburg, 2002) took *Agenda 21* as its starting point and produced a *Plan of implementation* (UNCED 2003). Sustainability became the key, with emphasis on protecting and managing the natural resource base of economic and social development and recognition of the linkages between poverty, the environment and the use of natural resources. A welcome feature is its recognition that agriculture plays a crucial role in addressing the needs of a growing global population, and is inextricably linked to poverty eradication. The targets of halving the numbers suffering from hunger and poverty are repeated, with a target date of 2015, adding an objective of halving the numbers without access to safe drinking water. Again, however, in the outputs of this Summit, the UN forecasts of population increases in the developing world are taken as background, given, data.

Thus, almost all major international institutions and lobbies, with one exception, treat population increase in the developing world as an independent variable (Table 3). The exception is the population lobby.

UNFPA and the population lobby

The population lobby consists of the UN Fund for Population Activities (UNFPA), together with pressure groups such as Marie Stopes International, the Optimum Population Trust, and Population Action International. In contrast to the lack of recognition of the population factor by other interests, UNFPA gives explicit recognition of the effects of population on environment, food security, poverty, and sustainability. This is illustrated by quotations from the *State of world population 2002*:

Developing countries with lower fertility and slower population growth have seen higher productivity . . . more productive investment, and faster economic growth . . . Addressing population concerns is critical to meeting the Millennium Development Goals of cutting global poverty and hunger in half by 2015 . . . Achieving many of the Millennium Development Goals depends in part on the universal availability of family planning and other reproductive and sexual health services . . . Population trends impact [on] every aspect of sustainable development.

UNFPA 2002, 7

Population came to wider public attention briefly at the Third UN International Conference on Population and Development (ICPD), Cairo, 1994. The *Programme of action* from this was unambiguous: 'Efforts to slow down population growth, to reduce poverty, to achieve economic progress, to improve environmental protection, and to reduce unsustainable consumption and production patterns are mutually reinforcing' (UN 1994, para 3.14) The major achievement of this Conference was a consensus on the means to check population growth. Governmental coercion had failed in India, and succeeded only under the autocratic regime of China, using methods not acceptable to the world at large. Rejecting this method, an ethically acceptable package was put forward consisting of:

- provision of access to family planning services (contraception, sterilization) to all;
- improvements in reproductive health, both of mothers and children;
- improvements in the education and status of women.

This set of measures has since received general acceptance. The Millennium Development Goals include promotion of gender equality, reduction of child mortality, and improvement of maternal health, although not family planning nor explicit mention of checking population increase. In current promotional activity by population institutions, it is the health and welfare of women and children which receives greatest emphasis.

Following the Cairo Conference, a number of Western governments made statements of intent on aid for population policy, but these led only to limited action. The Development Assistance Committee of OECD, the agency responsible for statistics of foreign aid, first recognized population as a sector in 1984. From 1987 to 1997 the proportion of total sector-allocable aid devoted to population programmes was close to 2%, rising to 6% in 2002 (Figure 2). The UK's contribution jumped to 6% in 1998, following the 'children by choice not chance' policy; it later fell below this level, but a

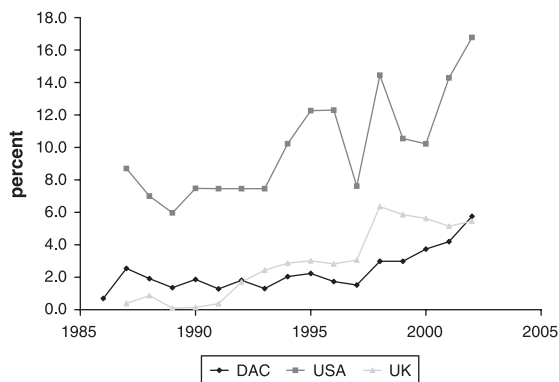


Figure 2 Percentage of total sector-allocable development aid directed at population programmes: all DAC countries, USA and UK
 Source: OECD (2004)

pledge has recently been given for continuing aid to UNFPA. Four governments, Norway, Sweden, the UK and Belgium, devote 4–6% of their aid to population programmes. An exceptional contribution, however, comes from the USA, which directed 12–16% of its aid to population in five of the last eight years for which data are available (OECD 2004); their family planning strategy includes as an objective, 'protecting the environment by stabilizing population growth' (USAID 2004). However, at a progress review conference held in 2004, the Director of UNFPA said that support for reproductive health programmes had fallen far short of commitments made at the Cairo meeting, and that an increase in such funding is critical for realizing the Millennium Development Goals (UNFPA 2004).

It is not yet possible to derive lessons from the special case of China. In 1979 the Chinese government took the view that population restriction was essential and instituted a one-child policy, using autocratic and coercive measures. Although moderated in the severity of its application, population restriction remains the policy, confirmed by law in 2001 (Short *et al.* 2000; Winckler 2002). By 2000 the net reproduction rate had fallen to 0.82 children per woman, and population increase to 1.3% per year; under the UN medium variant projection, population will reach a maximum of 1450 million by 2030, falling thereafter. Currently, China has one of the fastest-growing economies in the world; but in the short term this is due to liberalization of the economy, and not directly connected to population. In the longer term, the stabilization of population should reduce the present intense pressure on land resources. China's recognition of the need to control population is exemplary, although its

methods for doing so are socially and politically unacceptable in most countries.

Conclusions: linking Cairo with Johannesburg

The world's scientific academies, less obliged to follow political correctness than governments, reached clear and unambiguous conclusions in a conference in New Delhi in 1993, preceding the UN Cairo Conference. In a statement issued from this meeting they say:

There is no doubt that the threat to the [global] ecosystem is linked to population size and resource use . . . Family planning could bring more benefits to more people at less cost than any other single technology . . . Success in dealing with global social, economic and environmental problems cannot be achieved without a stable world population . . . We must achieve zero population growth within the lifetime of our children.

World's Scientific Academies 1993, 1, 8

Progress in reducing the rate of population growth is being made in most developing countries. The UN estimate for world population in 2050 was recently reduced from 9.3 to 8.9 billion, although half this difference in estimates is attributed to the tragedy of deaths from HIV/AIDS. The annual increase is now 77 million, down from its maximum of 85 million in 1986–89 (UN Population Division 2002). Every day, however, some 350 000 people are born and 150 000 people die, hence world population increases by 200 000 per day, nearly all in developing countries. This represents a colossal ongoing burden on governments' intent on reducing poverty and hunger.

There is a lack of mutuality between the population policy and other aspects of development. The population lobby sets out clearly and forcefully the effects of population increase on environment, food security, poverty, and sustainable development. The institutions and agencies responsible for the latter concerns, on the other hand, do not explicitly recognize that population increase is integral to their policies. The ethically acceptable package of population and reproductive health policies set out in 1994 at the UN Conference on Population and Development must be applied to the objectives of the World Conference on Sustainable Development in 2002. Institutions concerned with poverty, hunger and environment need to follow the policy road from Cairo to Johannesburg.

What should be the target? There is a large spread between the three variants, low, medium and high, for population projection given in UN forecasts (UN Population Division 2002). In the past, the medium variant projections have proved fairly accurate. The

low variant is defined in simple numerical terms, as the fertility is projected to remain 0.5 children per woman below that of the medium variant. Thus the definitions are not policy based; they do not say what actions by governments might lead to each variant. For less developed regions as a whole, the respective figures for the year 2030 are 6888 million for the medium variant, 7520 million for the high variant, and 6268 million for the low variant. If low variant figures could be achieved, by 2030 there would be 620 million fewer people in the less developed regions (676 million fewer in the world as a whole). Under the medium variant, the population of less developed regions would have reached 7699 million by 2050 and *still be increasing*, whereas under the low variant it would stabilize at 6385 million in 2040.

Checking of population growth alone is by no means a panacea. To reduce poverty and hunger, to check land degradation, and to promote sustainable development in rural areas will require investment in agricultural research, extension, and rural infrastructure; it will need participatory development, and action across the whole spectrum of development activities as they are now recognized (cf. Dasgupta 2000). Unfortunately, the modest rise in population-related aid in recent years has been accompanied by a massive decrease in assistance to the agriculture sector, which for DAC countries in total fell from 20.6% of total aid in 1985 to 8% in 2002 (OECD 2004). Hence, what the rural sector stands to gain in the long run from increased investment in population programmes has been lost by a drastic fall in assistance to agriculture. More important than international investment, and harder to achieve, is recognition by governments and peoples of developing countries of the key role of the rural sector in their economies. What is argued here is that the apparent unresponsiveness of agriculture to investment, its failure to show favourable benefit:cost ratios or to meet other evaluation criteria, is in part due to the negating effect of population increase.

Statements on population policy have mostly been made by economists and demographers. Approaching this question from a quite different starting point, that of a land resource scientist, and relying as much upon field observation in many developing countries as upon documentary sources, leads to the following conclusions.

- 1 If the rates of population increase in developing countries are not lowered, efforts to reduce poverty, hunger, and the suffering which these cause will constantly be thwarted, often nullified; and sustainable use of natural resources, avoiding land degradation, will not be achieved.

- 2 Policy statements about agriculture, food security, poverty and sustainability should explicitly recognize the role of population.
- 3 The proportion of development aid directed towards population-related aims, and in particular towards family planning services, should be much higher.
- 4 The set of ethically acceptable measures for checking population growth, put forward at the 1994 Cairo meeting, should be recognized explicitly by institutions concerned with the objectives of the 2002 Johannesburg conference.

Action to check population increase will be slow in its effects, operating through the time span of a generation and more. Politicians of developing countries will not find it easy to openly call for population limitation, and it would be still less acceptable for the West to tell them to do this. However, if there were general recognition of the benefits to society through removing the counteractive effects of population increase on efforts to reduce hunger and poverty, then there are diplomatic ways to advocate the package of population policies necessary to achieve this. The key prerequisite is awareness, in the first instance by international institutions, and in due course by national governments. Awareness brings about a change in attitudes, which in turn leads to action.

Emotion is normally out of place in scientific statements, but the statistics and rhetoric of international discussion can be translated into individual suffering. After a lifetime of seeking to promote the welfare of peoples of the tropics through work on the survey, evaluation and management of land resources, one feels deeply for the plight of families, caught in a state of endemic poverty and hunger through circumstances beyond their control. Without more explicit recognition that action to check population increase is an integral element in policy on poverty, food security, and sustainability, this suffering will continue.

References

- Alexandratos N** 1995 *World agriculture: towards 2010: an FAO study* Wiley, Chichester
- Allen W** 1965 *The African husbandman* Oliver and Boyd, London
- Birdsall N, Kelley A C and Sinding S W** eds 2001 *Population matters: demographic change, economic growth and poverty in the developing world* Oxford University Press, Oxford
- Boserup E** 1965 *The conditions of agricultural growth* Aldine, Chicago
- Bot A J, Nachtergaele F O and Young A** 2000 *Land resource potential and constraints at regional and country levels* FAO, Rome
- Brown L R** ed annual *State of the world* Norton, New York
- Brown L R and Kane H** 1994 *Full house: reassessing the Earth's population carrying capacity* Norton, New York
- Bruinsma J** 2003 *World agriculture: towards 2015/2030: an FAO perspective* Earthscan, London
- Carr S J** 1997 A green revolution frustrated: lessons from the Malawi experience *African Crop Science Journal* 5 93–8
- Cuffaro N** 1997 Population growth and agriculture in poor countries: a review of theoretical issues and empirical evidence *World Development* 25 1151–63
- Cuffaro N** 2001 *Population, economic growth and agriculture in less developed countries* Routledge, London
- Dasgupta P** 2000 Population and resources: an explanation of reproductive and environmental externalities *Population and Development Review* 26 643–89
- Devereux S** 1997 *Household food security in Malawi* Discussion Paper 362 Institute of Development Studies, University of Sussex
- Eastwood R and Lipton M** 1999 The impact of changes in human fertility on poverty *Journal of Development Studies* 36 1–30
- Ehrlich P** 1968 *The population bomb* Ballantine, New York
- Ehrlich P and Ehrlich A** 1990 *The population explosion* Hutchinson, London
- FAO** 1982 *Potential population supporting capacities of lands in the developing world* FAO, Rome
- FAO** 1984 *Land, food and people* FAO, Rome
- FAO** 1996 *Rome declaration on world food security and world food summit plan of action* FAO, Rome
- FAO** 2002 *World food summit 5 years later* (<http://www.fao.org/worldfoodsummit>) Accessed 1 September 2004
- FAO** 2004a FAOSTAT database (<http://apps.fao.org>) Accessed 1 September 2004
- FAO** 2004b TERRASTAT database (<http://www.fao.org/ag/agl/agll/terrastat>) Accessed 1 September 2004
- FAO** 2004c LADA – land degradation assessment in drylands (<http://www.fao.org/ag/agl/agll/lada>) Accessed 1 September 2004
- FAO-UNESCO** 1970–80 *Soil map of the world 1:5 000 000* Vol 1–10 Unesco, Paris
- Fischer G and Heilig G K** 1998 Population momentum and the demand on land and water resources in **Greenland D J, Gregory P J and Nye P H** eds 1998 *Land resources: on the edge of the Malthusian precipice?* CAB International, Wallingford 9–27
- Greenland D J, Gregory P J and Nye P H** eds 1998 *Land resources: on the edge of the Malthusian precipice?* CAB International, Wallingford
- IFPRI** 2002 *Achieving sustainable food security for all by 2020: priorities and responsibilities* IFPRI, Washington DC
- Kettlewell R W** 1955 *Outline of agrarian problems and policy in Nyasaland* Legislative Council Paper Government Printer, Zomba, Nyasaland [Malawi]
- Kravald O** 2001 Has population growth restricted improvements in food availability per head, 1970–95? *Population Studies* 55 105–17
- MacDonald A S** 2003 Population and urbanisation in a subsistence agriculture context *Tropical Agriculture Association Newsletter* 23 22–4

- Malthus T R** 1798 (revised 1803) *An essay on the principle of population* Johnson, London
- Meadows D H, Meadows, D L, Randers J and Behrens W W** 1972 *The limits to growth* Earth Island, London
- Myers N** 1998 Global population and emergent pressures in **Polunin N** ed *Population and global security* Cambridge University Press, Cambridge 17–46
- OECD** 2004 Database: Development Assistance Committee (<http://www.oecd.org/dac>) Accessed 1 September 2004
- Oldeman L R, Hakkeling R T A and Sombroek W G** 1990 *World map of the status of human-induced soil degradation* ISRIC, Wageningen
- Pinstrup-Andersen P and Pandya-Lorch R** eds 2001 *The unfinished agenda: perspective on overcoming hunger, poverty, and environmental degradation* IFPRI, Washington DC
- Short S E, Ma Linmao and Yu Wentao** 2000 Birth planning and sterilization in China *Population Studies* 54 279–91
- UN** 1994 *Program of action of the 1994 International Conference on Population and Development* UN, New York
- UN** 2000 *UN Millennium declaration* UN, New York
- UN** 2003 *Report of the World Summit on Sustainable Development* 26 August–4 September 2002 Johannesburg UN, New York
- UN** 2004 UN millennium development goals (<http://www.un.org/millenniumgoals>) Accessed 1 September 2004
- UNCED** 1992 *Agenda 21: a programme of action for sustainable development* UNCED, Rio de Janeiro
- UNCED** 2003 Plan of implementation (<http://www.johannesburgsummit.org>) Accessed 1 September 2004
- UNEP** 2002 *Global environment outlook 3 (GEO-3)* Earthscan, London
- UNFPA** 2002 *State of world population 2002* UNFPA, New York
- UNFPA** 2004 More funding needed to back strong commitment to reproductive health and women's rights (<http://www.unfpa.org/news/news>) Accessed 1 September 2004
- UN** Population Division 2002 *World population prospects: the 2002 revision* UN, New York
- USAID** 2004 Health: population (http://www.usaid.gov/our_work/global_health/pop) Accessed 1 September 2004
- Winckler E A** 2002 Chinese reproductive policy at the turn of the millennium: dynamic stability *Population and Development Review* 28 379–418
- World Bank** 2003 *Working for a world free of poverty* World Bank, Washington DC
- World Food Program** 2002 Prevalence of undernourishment in developing countries (<http://www.mindfully.org/Food/Under-nourishment-WFP2002.htm>) Accessed 1 September 2004
- World Food Program** 2004 Emergency operations (<http://www.wfp.org>) Accessed 1 September 2004
- World's Scientific Academies** 1993 *Population summit of the world's scientific academies: a joint statement by 58 academies* Royal Society, London
- Young A** 1994 *Land degradation in South Asia: its severity, causes and effects upon the people* World Soil Resources Report 78 FAO, Rome
- Young A** 1998 *Land resources: now and for the future* Cambridge University Press, Cambridge
- Young A** 1999a Malawi 1959–1999: a 40-year perspective *Tropical Agriculture Association Newsletter* 19 20–2
- Young A** 1999b Is there really spare land? A critique of estimates of available cultivable land in developing countries *Environment, Development and Sustainability* 1 3–18
- Young A** 2000 How much spare land exists? *Bulletin of the International Union of Soil Sciences* 97 51–5
- Young A** 2003 Potential and constraints of soils for increased agricultural production: how much spare land? in **Lahmar R, Held M and Montanarella L** *People matter: food security and soils* TORBA, Montpellier
- Young A** 2004 Famine in Africa – the fundamental causes (<http://www.land-resources.com>) Accessed 1 September 2004