



## How Do Countries Achieve Optimum Populations?

Optimum population has been defined in a number of ways but commonly it involves the concept of an ideal population living and working in a given area. The number of people in that area will be in close balance with the resources available. Such a definition implies that a state of equilibrium will exist between population and resources. If the population is below the optimum population then the area will be under-populated, whereas if numbers exceed the optimum population then the area can be said to be over-populated.

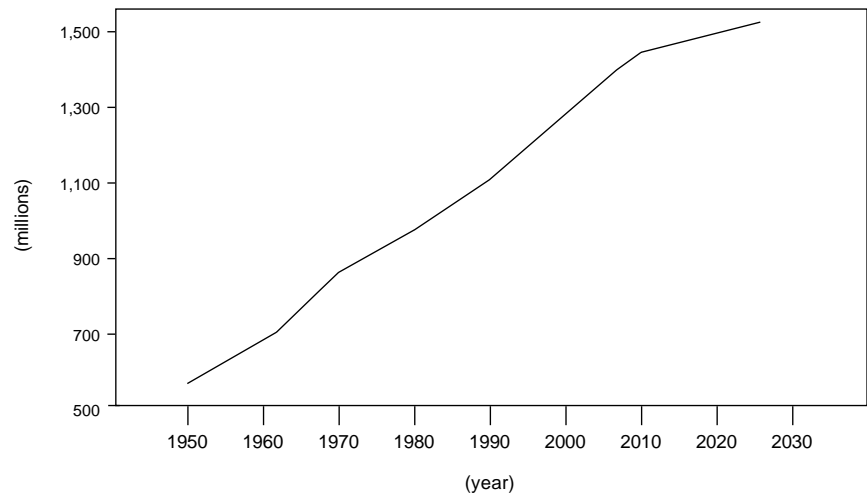
**Exam Hint** - The strongest candidates will be expected to provide an accurate definition of optimum population and to provide evidence that they understand the difficulties of making such a definition. Equally important is the need to achieve a balance between the two sides of the optimum population equation - population control and management of resources.

Optimum population is often described in economic terms, commonly as the population which, given available resources and skills in a particular area, produces greatest GNP or Gross National Product. The implication is that if the population is either below or above the optimum population, total GNP/income per capita/standard of living would be lowered. This is an over-simplistic measure since the crude size of a population does not provide an accurate estimate of its economic output. This can be dramatically affected by factors such as the age structure, sex structure and educational level of the population. Equally, indices such as GNP may not provide an accurate picture of the standard of living of the entire population - high GNPs can hide large sectors of a population which may not even have the basic necessities of life.

From an environmental perspective, it is clear that maximum economic output of any one renewable resource (e.g. minerals such as zinc, copper, iron) or energy sources such as coal, oil and gas, is unsustainable since, by definition, such resources are finite. The process of maximising economic output will result in widespread environmental degradation. Interestingly, recent evidence has highlighted the fact that it is not the impending exhaustion of non-renewable **stock resources** such as coal and oil which poses the greatest threat but the chronic degradation of non-renewable **flow resources** such as air, water and soil which more seriously weakens the usefulness of this definition. Despite these problems, many countries seem to have accepted the concept of optimum population and have embarked upon population control methods - usually in order to reduce population rather than increase it - in an effort to balance the total population against the resources that are available.

### Case study: China

**Fig 1. China's Population 1950-2025**



Between 1949 and 1990 China's population increased from 540 million to 1,134 million people and now has an annual increase of 14 million people.

**Food production** has been increased by:

- Pooling together of labour, land and equipment into co-operatives and then communes.
- Increasing mechanisation - increased use of fertilisers and pesticides, introduction of high yielding varieties, better irrigation, greater use of multi-cropping.

**Population control** has been achieved by:

- Government advice and pressure, "**Later, longer, fewer**" referring to marriage, the interval between births and the number of children respectively was vigorously communicated through the co-operative and commune system.

- Increased use of contraceptives and abortion.
- Increased emphasis on the economic and health benefits of fewer children
- **Glory certificates** given to couples with one child increased financial rewards, access to jobs and educational benefits provided the family promised to have no further children. This **one child per family policy**, introduced in 1979 aimed to decrease national population growth to 0 by the year 2000, stabilising the population at 120 million.
- In 1995 the Chinese Government introduced a **eugenics** law under which couples who wish to marry must undergo screening for certain genetic diseases, infectious diseases and mental disorders. Carriers of "inappropriate" genes are only allowed to marry if they agree to sterilisation or long-term contraception.

## Population Control

### Case Studies In Asia

Many countries in South East Asia have adopted ambitious population programmes since the 1960s.

In 1966 **Singapore** established a five-year rolling programme of measures actively promoting the two-child family norm. Contraceptives were widely distributed and abortion and sterilisation were legalised. Sterilisation was promoted as the most effective contraceptive method for those who had completed their families. Delivery charges in government hospitals were graduated according to the number of children the family had already had and preferential treatment in choice of primary schools was given to the first three children per family. No priority was given to public housing for large families.

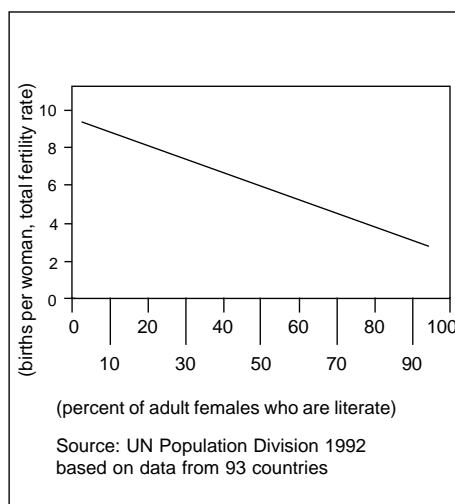
By 1975 the fertility rate had dropped to replacement level and **child spacing** became the main policy objective. The total fertility rate had dropped from 4.7 children in 1965 to 1.4 in 1986. This below replacement -level of fertility would of course have meant that the country would have experienced negative population growth and in 1987, in response to this threat, a new policy encouraging marriage and child-bearing under the slogan “**Have three or more if you can afford it**” was adopted. Incentives such as tax rebates and subsidised child care were implemented.

In **Vietnam** the socialist government established a family planning programme encouraging women to have their first child after the age of 22, (urban women) or 19, (rural women); to have only one or maximum two children and to ensure that a space of at least five years should exist between the first and second child. Only 5% of the total female population (36 million) are over reproductive age.

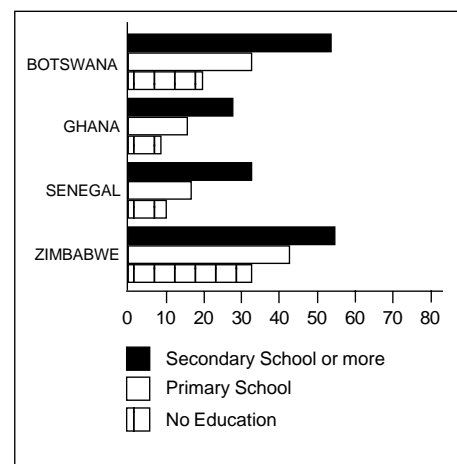
In the **Philippines** the government introduced widespread legislation to encourage families to have fewer children. Income tax reductions were limited to the first four children, paid maternity leave was abolished after the fourth child and couples using contraceptives were rewarded with lower interest rates on rural bank loans for any kind of agricultural development. From the year 2000 half a million women will be added annually to the cohort of reproductive age. Inter-communal family planning centres, communal health clinics and women-status improvement programmes are all aimed to overcome this potential threat. Couples who agreed to undergo IUD insertion were exempted from the normally requisite month per year of corvee labour. Violations of such family planning policies resulted in loss of bonuses and family allowances.

The slogan “**Development is the best contraceptive**” has lost some of its impact; in many countries such as **Africa** real increases in income per capita show no correlation with birth rates or the family’s perceptions of ideal family size. Higher levels of education, particularly of women, do seem to be positively linked not only with declining fertility (See Fig 2a and b) but with declining mortality rates and a general increase in health. Increasing the educational level of women has proved to be extremely effective in improving reproductive health as education helps rural women to move away from traditional roles into paid work. Further children are then seen as a threat to this freedom and as a cost in terms of the potential earnings lost.

**Fig 2a. Variations of Fertility Rate with Female Literacy (1990)**



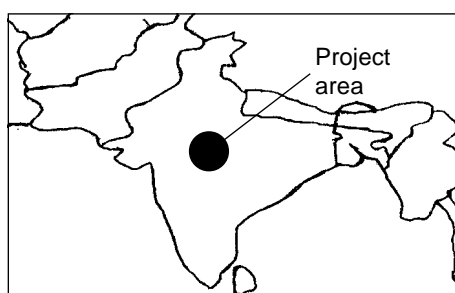
**Fig 2b. Percentage of Women Who Practise Contraception (Selected developing countries)**



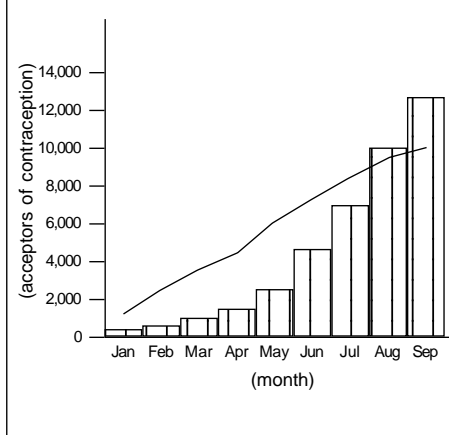
### ‘The Small Family by Choice Project’ (India)

The Northern India states of Bihar, Rajasthan, Madhya Pradesh and Uttar Pradesh were identified as high need (higher than average birth and death rates) and low practice (contraception). The main problem was that the status of women was very low, early marriage and child-bearing were the norm and the strong preference for sons was reflected in the low literacy and poor health of women.

By setting up integrated projects (for example, focusing on increased contraception, better nutrition and increasing literacy at the same time) at the community level (i.e. local people were trained to run the projects) rapid progress was made (See Fig 3).



**Fig 3. Success Of The Project**



### 1992 Demographic features: Madhya Pradesh

	Population (m)	Density	Female per 1000 males	Female literacy rate	Mean age at marriage
State: Madhya Pradesh	66.1	149	932	23.2	16.6
National Average	844	267	929	39.4	18.3

### Increasing The Supply Of Other Resources

Agricultural innovations since Malthus's time have dramatically increased food production. However, the supply of even apparently finite resources such as metals has ben increased. There have been many gloomy predictions over the last 30 years that stocks of non-renewable resources such as metals and fossil fuels would have been seriously depleted by the present day but this has not been the case. **Neomalthusians** such as Paul Ehrlich have often underestimated humans' ability to effectively increase the amount of resources available. Over the last 15 years the market price of almost every valuable metal has

decreased, even when taking inflation into account, but this is precisely the opposite of what would have happened if such materials were becoming scarcer. Effectively, humans have increased the availability of such resources by:

1. Developing much more sophisticated techniques (such as radar imaging) for locating mineral deposits.
2. Recycling minerals.
3. Resource substitution e.g. where one metal has been substituted for another or, for example, where plastic has been substituted for metals. This effectively prolongs the life of such metals.

**Exam hint** - students can usually gain credit for a detailed explanation of a very small number of relevant case studies or for a more superficial explanation of several. However, the key point is that case studies should illustrate the main points and should be of **explicit** relevance to the title.

### Acknowledgements;

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Geo Press  
10 St Pauls Square  
Birmingham  
B3 1QU

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### AFRICA:

#### Too many people or too few?

**Exam hint** - many students write as if Africa was one country...!

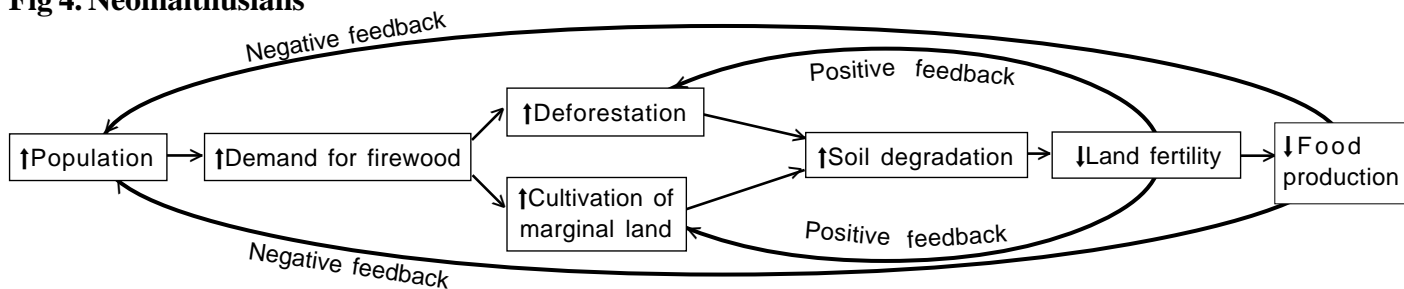
Under-developed countries often have high fertility rates. Children represent net economic gains to families since they contribute more through their work than they cost in terms of food, clothing and welfare etc. Children provide security, particularly to women during old age, and in many African countries this is particularly important given the traditional roles which women carry out; food and water gathering, in particular, become increasingly difficult for elderly women and these roles are often transferred to the children. In many African countries, children are also seen as an essential way of maintaining cultural continuity.

At its most basic, this is illustrated in the belief, held by many groups, that ancestors live through children.

Higher fertility rates and large and growing populations have been blamed for decades for the environmental degradation and economic and social problems which many African countries have faced. The phrase **"population is the ultimate problem"** summarises the views of Malthus and his present day followers (Neomalthusians). However, economists such as **Julian Simon** and economic geographers such as **Ester Boserup** have argued the opposite case; that the real problem in many African countries is that there are simply not enough people to act as a stimulus to the types of technological advances which transformed the agricultural systems of developed countries. **"Necessity is the mother of invention"** sums up Boserup's views which are based upon certain assumptions, the most important of which is that such populations

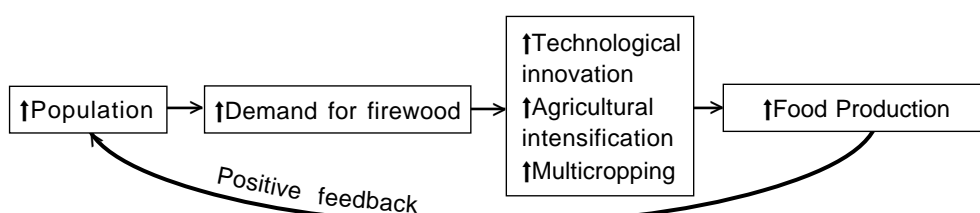
**Exam hint** - The strongest candidates will realise that there is conflicting evidence for conflicting views.

Fig 4. Neomalthusians



"Increasing population leads to environmental degradation which limits further population growth"

### Boserupians (after Ester Boserup, a Danish economist)



"Necessity is the mother of invention". "Increasing population drives agricultural productivity which allows further increase in population".

**Exam hint** - Wherever possible, candidates should try to explain rather than merely describe. Why does declining land fertility lead to increasing deforestation?