

كلية التربية - شعبة الجغرافيا - الفرقة الرابعة

مقرر: نصوص جغرافية Geographical Texts Population & Resources

الموضوع: Theoretical discussion

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POPULATION & RESOURCES IN RURAL DEVELOPING WORLD:

- Theoretical discussion.
- Population growth and Resources theories
 - Thomas Robert Malthus
 - Ester Boserup



* Introduction

- * The interest of geographers in the relationship between population and resources has long been established. It is reflected in the ecological approach to geography which centres on the relationship between man and his environment.
- * There are many theories and empirical studies that have addressed the relationship between population pressure and resources.
- * However, the most important general theories are those of **Malthus** and **Boserup**.
- * In addition, other works have developed these ideas and explored the inherent controversies (*debate*) and contradictions between Malthus and Boserup, the most important of which are those conceptualizations regarding the responses to population pressure in rural areas in the Developing World, notably those of **Grigg** and **Bilsborrow**.

Theoretical discussion

- * **Population growth and agriculture theories**
- * The most important theories examining population growth and population pressure on resources are those of **Malthus** and **Boserup**.
- * In this section we present a summary of both theories, in order to answer the question what is the position of rural area in the Developing world and Egypt in terms of the Malthus/Boserup debate?

Thomas Robert Malthus



- * Two centuries ago **Thomas Robert Malthus** an English political economist, put forward a theory of the relationship between population growth and resources.
- * Writing in 1798 his alarmist “Essay on the principle of population”, “I think I may fairly make two postulates.
- * **First**, that food is necessary to the existence of man.
- * **Secondly**, that the passion between the sexes is necessary and will remain nearly in its present state. These two laws, ever since we have had any knowledge of mankind, appear to have been fixed laws of our nature”.
- * **postulates** = a thing suggested or assumed as true as the basis for reasoning or discussion.

* Malthus

- * Malthus's theory is based on two principles:
- * 1- In the absence of any checks, human populations could potentially grow at a **geometric rate** (2,4,8... 256). They could double every twenty-five years.
- * 2- Production from the land (subsistence), even under the most favourable circumstances, could at best increase at an **arithmetic rate** (1,2,3... 9).

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|--------------------|----------|----------|----------|----------|-----------|-----------|-----------|------------|------------|------------|-------------|-------------|-------------|
| Population | 1 | 2 | 4 | 8 | 16 | 32 | 64 | 128 | 256 | 512 | 1024 | 2048 | 4096 |
| Subsistence | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |

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- * Taking the population of the world at any number, a thousand millions, for instance:
 - * The human species (*SpēSHēz*) would increase in the ratio of : 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, etc.
 - * And subsistence as : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, etc.
 - * In two centuries and a quarter, the population would be **to** the means of subsistence as 512 **to** 10:
 - * In three centuries as 4096 **to** 13,
 - * And in two thousand years the difference would be almost incalculable, **though** the produce in that time would have increased to an immense (massive) extent.

* **Malthus and neo-Malthusians (Con.)**

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- * By the law of nature, man cannot live without food, and, under this law, population is **inevitably limited** by the means of subsistence (*Malthus, 1830, in Demko, et al., 1970*).
- * Moreover, according to Malthus, population growth increases with increases in the means of subsistence, unless prevented by positive or preventive checks.
- * **Positive checks** are those that affect the death rate including misery, diseases, poverty, famine, and wars.
- * The **preventive checks** are those that affect the birth rate, including celibacy and delayed marriage

* **Malthus and neo-Malthusians (Con.)**

- * Generally, Malthus suggested that more food, higher real wages and better health would lead to increases in the population and labour supply per unit of land.
- * However, this increase of population would lead to a reduction in the availability of food per person, falling real wages, and increasing poverty, which lead to rises in mortality (pressing population down again and in this the case in the non-European World).

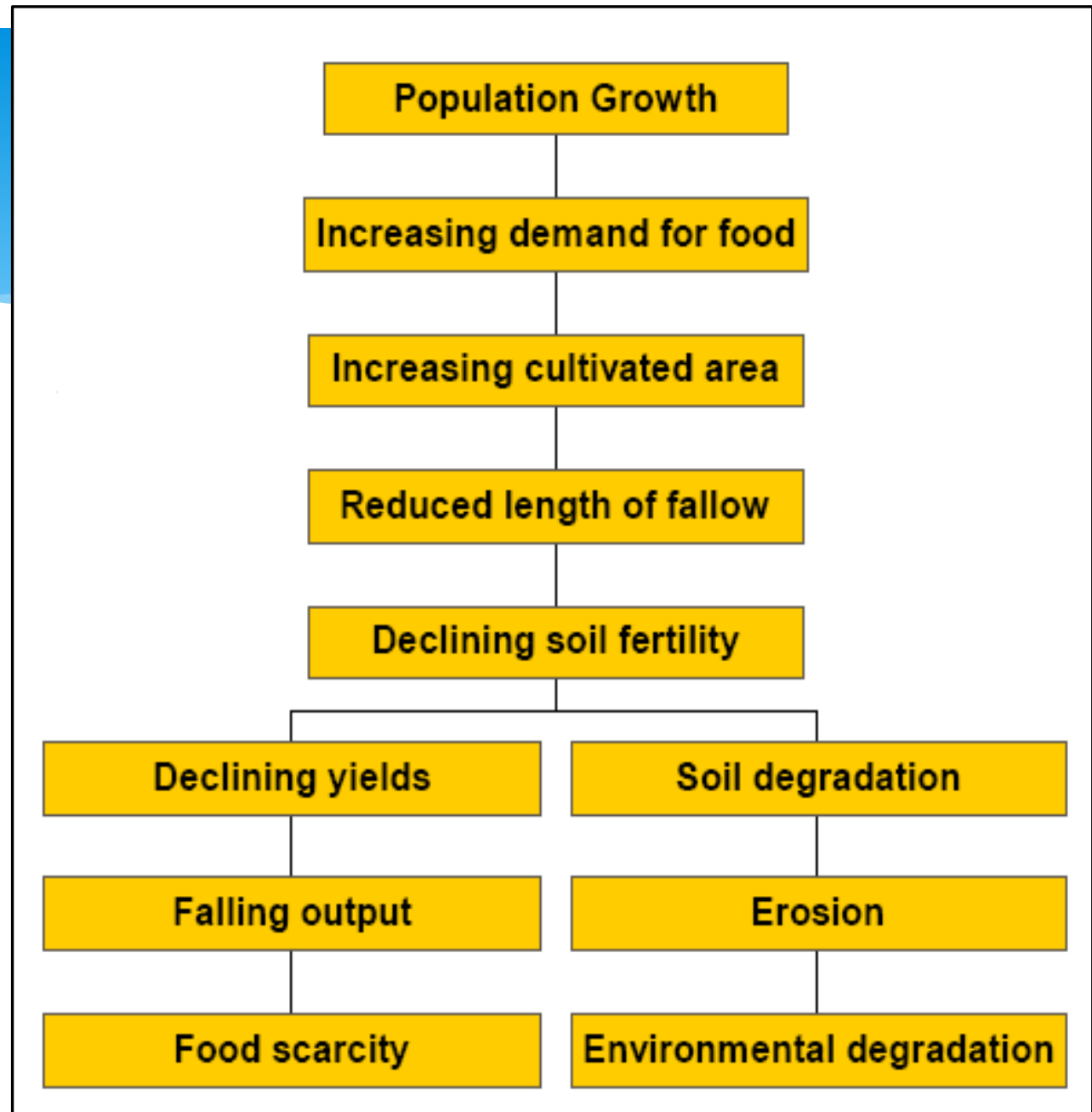
- * **Seven** major **points** regarding evolution found in the 1798 Essay:
- * 1) Population level is severely limited by subsistence.
- * 2) When the means of subsistence increases, population increases.
- * 3) Population pressures stimulate increases in productivity.
- * 4) Increases in productivity stimulate further population growth.
- * 5) Since this productivity can never keep up with the potential of population growth for long, there must be strong checks on population to keep it in line with carrying capacity.
- * 6) Positive checks will come into operation as population exceeds subsistence level.
- * 7) The nature of these checks will have significant effect on the rest of the sociocultural system--Malthus points to misery, vice, and poverty.

- * **Malthus**

- * **Criticisms:**

- * The most important **criticisms** of the **Malthus** model which has not been confirmed by events since 1798; are:
 - * **First**, that he ignored the possibility that improvements in crop rotation and seeds and the use of fertilizers will increase food supplies, and,
 - * **Secondly**, he did not consider changes in transport systems, or the impact of technological progress, which led to more industrialization.
 - * **Thirdly**, he ignored the role of birth control as a factor to check population growth.
- * However, the view of contemporary **neo-Malthusians** is different from Malthus two centuries later, with the belief that human intervention can reduce rapid population growth through birth control.

Population Growth and Environmental Degradation according to (neo) Malthus.

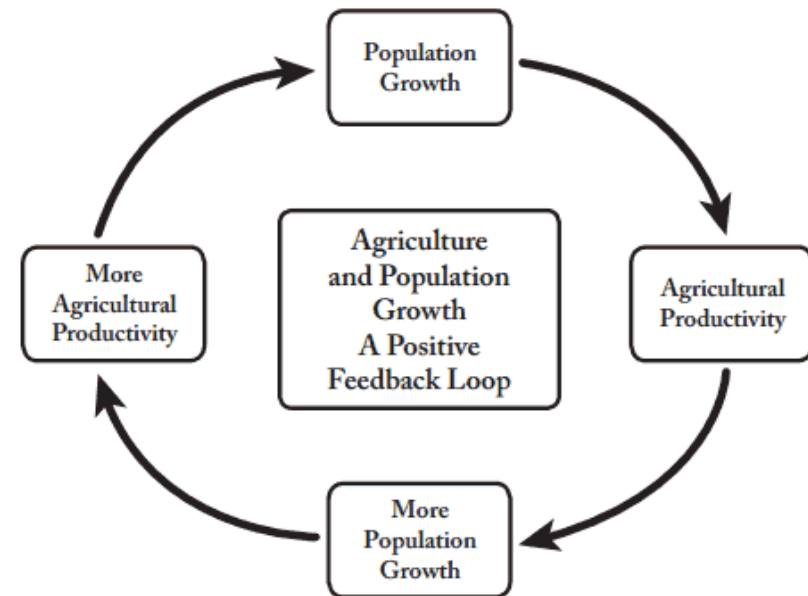


Ester Boserup



Ester Boserup

- * In 1965, in her book “The Conditions of Agricultural Growth: the economics of agrarian change under population pressure”, the Danish economist Ester Boserup suggested an argument about the relationship between population growth and food supply (agricultural resources) that was directly the opposite of that of Malthus .



* **Ester Boserup:**

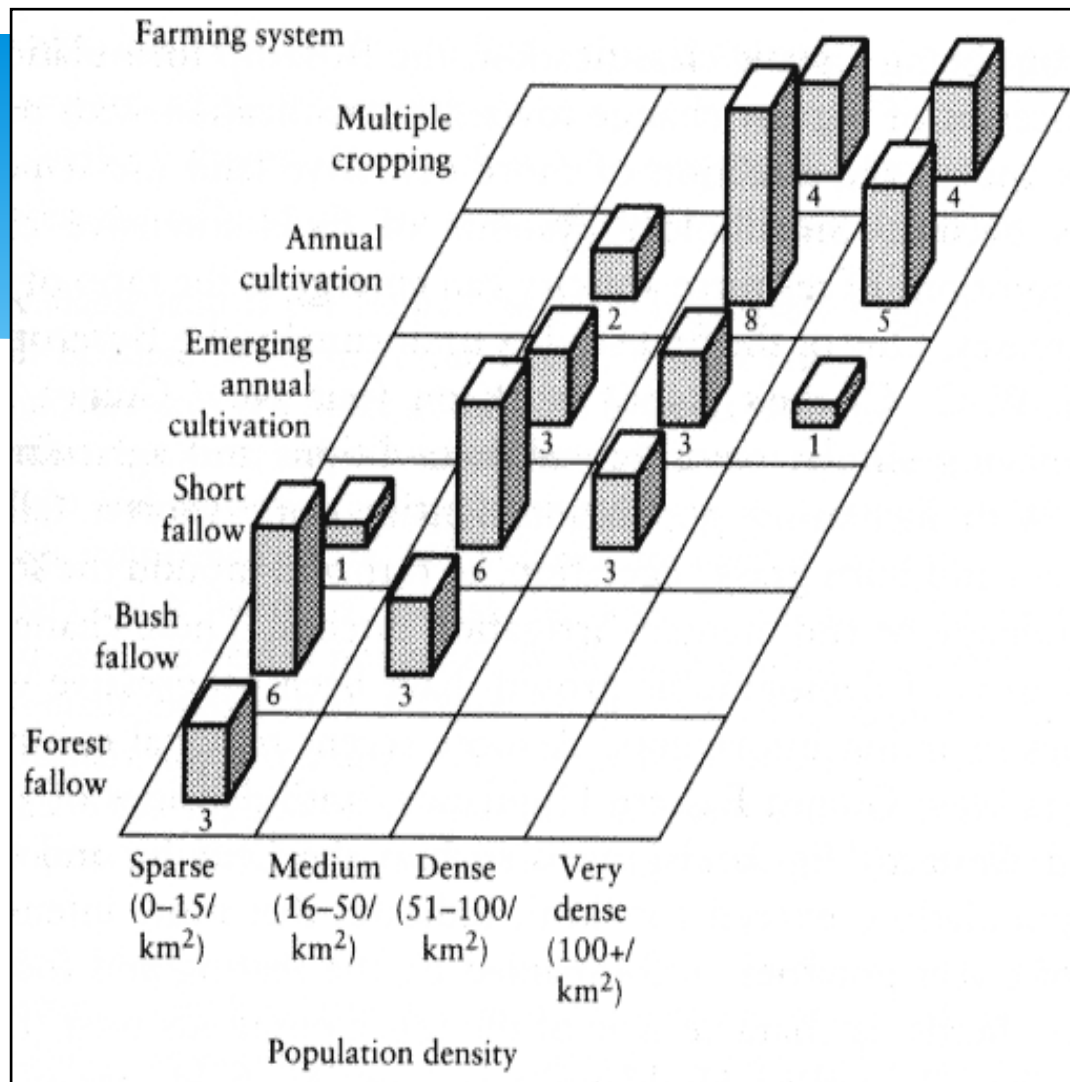
- * Malthus considered population growth as the dependent variable, determined by proceeding changes in agricultural productivity.
- * However, Boserup approached from the opposite direction, regarding population growth as the independent variable which in its turn is a key factor determining agricultural developments (*Boserup, 1965*). This suggests that population growth can lead to development rather than preventing it.

- * **In summary, Boserup** (1965) argued that under the pressure of increasing population, there has been a shift in recent decades from more extensive to a more intensive system of land use in underdeveloped areas.
- * Farmers gradually reduced their fallow periods from long to short fallow, to annual cropping, and to multi-cropping under population pressure (*pp. 15-6*), in order to make their land more productive.
- * Boserup defined the concept of **intensification** in agriculture as a new way of the gradual change towards patterns of land use which allow the land to be cultivated more frequently than before (*Boserup, 1965*).
- * And also she argued that if people are working longer on the land, this will lead to more intensive crop growing and they can cope better with population pressure.

Population Growth and Food Production

- The essence of Boserup's ideas may be stated briefly. Whereas Malthus thought that food supply limited population size, Boserup suggested that in a pre-industrial society an increase in population stimulated a change in agricultural techniques so that more food could be produced.
- Her ideas may be summarized by the old saying **‘Necessity is the Mother of Invention’**.
- Population growth has thus enabled agricultural development to occur.

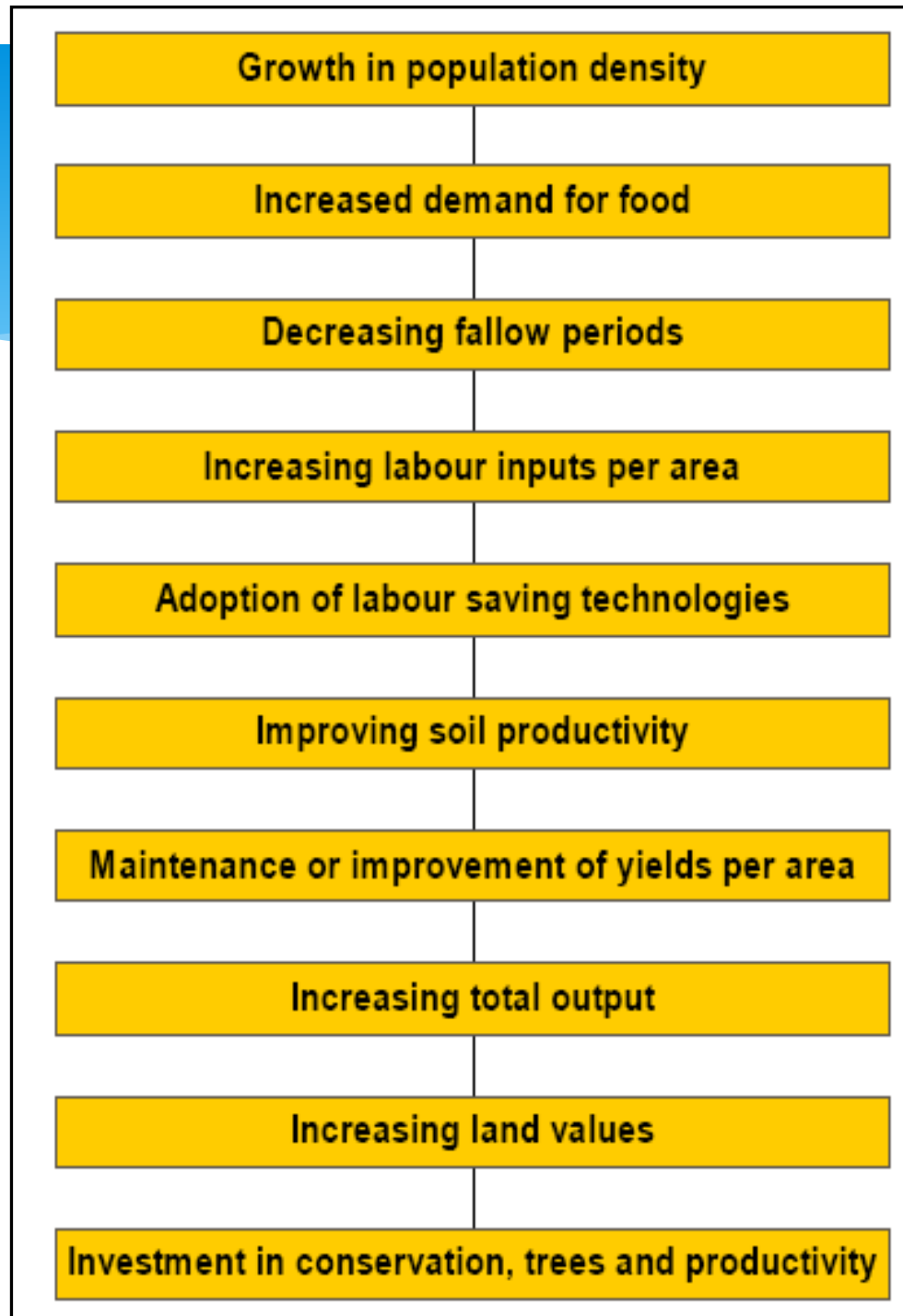
- * In terms of land **intensification**, Boserup (1965) classified the system of land use, with respect to the degree of intensity, into five systems (stages) as follows:
- * **Long-fallow (forest-fallow) cultivation**: in this system of land use, areas of land are cleared in the forest and cultivated for a year or two, and then left for a long fallow period, at least some twenty to twenty five years, before the cultivation of the next crop.
- * **Bush-fallow cultivation**: under this system the fallow period is much shorter, usually somewhere between six and ten years.
- * **Short-fallow cultivation**: in this system the fallow period between crops is shorter than the long-fallow, where it is only one or two years.
- * **Annual cropping**: under this system the land is left uncultivated only for several months, between the harvest of one crop and the planting of the next.
- * **Multi-cropping**: this is the most intensive system of land use, where the same area of land is cultivated by more than one crop per year. The cultivation of a new crop must take place shortly after the harvesting of the preceding one.



* Fig. 15: Population density and agricultural intensification in nine African countries. Figures inside the grid represent the number of population groups in each category (total = 52).

- * As a result of population pressure, societies **move** from long-fallow cultivation towards multi-cropping (Boserup, 1965), and most of the world has now moved to stages (4) and (5).
- * Boserup's model can be **summarised** as follows:
- * Increases in population lead to an increase in supply of labour, and as a result, the increase in the demand for food.
- * The **response** to this increase in population will be through land intensification using agricultural technology, which leads to the increase in demand for labour to work on the farm, which finally leads to the increase in crop production .

Growing population Density and Environmental Conservation According to Boserup.



Criticism

- * **While she** suggested that over-rapid population growth can lead to an increase in agricultural productivity, she admitted that land degradation could occur under population pressure, but the application of technology, such as terracing and fertilizer use, could minimize the damage
 - * E.g. population pressure as one of the reasons for desertification in the Sahel region.
- * **Boserup's** theory based on assumption of “closed society” –not the case in reality (migration).
- * **Boserup** chose her examples from tribal societies in equatorial countries with slowly rising population densities.
- * **She** also conceded that very high population growth rates are unlikely to fit with her model

Criticism (Con.)

- * **Population density** by itself is clearly not only the reason to explain the intensification of agriculture. The transportation, infrastructure, access to urban markets, and soil fertility can be as important as rising population density. But in her later work (1981) Boserup gave a little attention to those factors.
- * Boserup mainly used the **frequency of cultivation** to measure intensification. However, Lele & Stone (1989) suggested that agricultural intensification can also be measured by a shift from low to high value crops and increase in yield per hectare.
- * The **intensity of cultivation** is only one of many determinant variables, which should **include** the choice of crops actually grown, the quality of cultivated land (soil fertility), the permission to grow high value crops, and the size of output.
- * **Generally**, Boserup examined only two responses to population pressure in rural Developing World, which **land intensification** and **rural out-migration**. But she neglected the possibility of fertility decline response.

Neo-Malthusians VS. Boserupians

- * Neo-Malthusians identify negative expectations of the impact of population growth in development including environmental deterioration, poverty, and famine.
- * In contrast, Boserupians have positive expectations, where population growth leads to land intensification and increases in crop production.
- * However, both perspectives play down the potential of trade in goods, ideas, and technology as explanatory factors.
- * According to the Malthusian view, it is population growth that leads primarily to overpopulation and the inevitable deterioration of per capita subsistence; in the Boserupian view it is primarily responsible for population pressure to which societies can positively respond to raise productivity and incomes.