

## **Population, Climate Change and Food Security**

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Let me initiate with a truism: humans, like other animal species, need food, in order to survive and prosper; but food needs to be produced, and production depends on technology and land. Food, even if produced in sufficient quantity to sustain a population, needs to be made available to all, in order to ensure a fair level of nutrition. In the view of Malthus, food, or subsistence, is a limiting factor to population growth, the remedy being the cultivation of more land until new limits are reached. In the eyes of Boserup, population growth is a stimulus for the invention or adoption of improved technology in cultivation, generating, in this way, new resources. The two theories are only apparently contradictory: in Boserup's view technological progress "buys time" to mankind, and if considered in the long run of history, it is a "temporary" remedy to the pressure of population on land. In a similar way, in Malthus' theory the acquisition of new land is also a "temporary" relief against the stress of population growth. Certainly when Malthus wrote, the earth's population was only one billion, and only a little over two billion when Boserup was conceiving her theory; but their intellectual contribution is still alive and relevant now that the world population is approaching the eighth billion mark.

The Cyberseminar is a welcome opportunity for discussing whether Malthus is still with us, and whether population growth - in a planet where land and water are limited and climate is changing – endangers the production of a sufficient amount of food and its equitable distribution, by this way eroding food security and increasing poverty and malnutrition. On the other hand, should we believe in Boserup's suggestion that population growth will stimulate innovation and avert, until population ceases to expand, a malthusian crisis? This debate is old as mankind, but it is a good thing if it is continuously rehearsed as circumstances keep changing.

1 -World population<sup>1</sup> is supposed to grow by approximately 2 billion between 2020 and 2050 (from 7.8 to 9.7 billion), at a rate of 0.7% per year. In the following 50 years population will reach 10.9 billion, with a rate of increase of 0.2%. Conveniently higher rates of increase of food production will have to be achieved, if hunger and malnutrition, now affecting a billion people or so, must be eliminated. Recent Fao projections<sup>2</sup>, under different scenarios, show a comfortable increase of daily dietary consumption in the next 30 years in the Low and Middle Income Countries (LMIC: from 2674 kcal per day per person in the base year, 2012, to

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<sup>1</sup> UN, World Population Prospects, the 2019 Revision, Medium variant

<sup>2</sup> FAO, The Future of Food and Agriculture. Alternative Pathways to 2050, Rome 2018

2853 with the BAU, business as usual scenario, 2898 with a transition to sustainability scenario or TSS, but only to 2724 with the less favorable SSS scenario). *Do we agree that the above projections are plausible ones and useful for the debate? Vigorous social and fertility and maternal health policies could perhaps reduce the 2020-2050 increase by a few hundred million, and alleviate the pressure of population on food resources. Is this feasible?*

2 – At the regional, national, subnational level, demographic heterogeneity is at its highest historical level. Fertility, as measured by the number of children per woman (TFR) maybe as low as 1 and as high as 5; life expectancy at birth as low as 50 and as high as 85; rates of growth vary between -1% and +3%. Rural-urban differences in fertility, mortality and migration are also widening. *In what measure demographic heterogeneity impacts on inequality in food availability and security?*

3 – In Sub-Saharan Africa (SSA) population will more than double over the next 30 years. This populous area risks falling in a Malthusian trap: poverty nourishes hunger, malnutrition and high infant mortality which, coupled with high fertility, imply a high rate of growth that generates more poverty, in a negative spiral: **Food → Nutrition → Diseases → Survival → Reproduction → Demographic growth → Food ...**

*Is it possible to interrupt this negative spiral? And how?*

4 -Children are particularly vulnerable; inadequate nutrition impedes the proper development of physical and cognitive capacities, has a negative effect on the learning capacities of the child, and ultimately depresses the formation of human capital, with negative consequences extending across individuals' entire lifespan. Inadequate nutrition, therefore, may produce another negative spiral that intersects with the one outlined above:

**Inadequate nutrition → Retardation of physical growth → Inadequate accumulation of cognitive abilities → Diminished Productivity → Diminished earnings and income**

There are countries where malnutrition is rampant (India) while achievements in other fields (IT, for instance) are outstanding. The fight against malnutrition is therefore a priority. *Is this the responsibility of the State? Are market forces adequate to lead the fight?*

5 – Population growth is an important driver of greenhouse gases emissions and global warming. According to the IPCC, net of the effects of energy intensity of GDP and of carbon intensity of energy, population growth accounts for about 40% of the increase in global emissions from 1970 to 2010. Slowing population growth would therefore be a rather efficient way of contrasting global warming. This is not a surprise, but the issue appears to be a sensitive one, rarely addressed in the “official international forum”. *Here is an interesting task for demographers: clarify the links - with appropriate data and models – between population growth and emissions of greenhouse gases. In other words: dissecting the demographic component of the anthropogenic driving force of global warming*

6 – Anthropization, directly or indirectly, now affects between half and two thirds (according to definition) of the 135million square kilometres of the emerged lands of our planet. Beside

global warming, for which population growth bears its share of responsibility, there are other important population threats to the environment such as human intrusion into the great forests, and particularly the rainforests, whose integrity is a guarantee of the bio-natural equilibrium; the intensification of human settlement in the most precarious habitats, in particular along coasts and on the shores of rivers and lakes; the explosion of urbanization processes and particularly the unchecked growth of megalopolis. *The analysis of these processes is still at the initial stage, new data and methods are needed, and new demographic expertise is necessary.*

7 – Global warming is supposed to cause flows of migrants from areas, mainly in Africa and Asia, that will suffer a high degree of desertification. These areas are now host to about 200 million people; motivations for emigration are obviously linked to the impoverishment of primitive agriculture and of the pastoral economy in the affected areas. *Will these flows be mainly internal? Or will they be international, to bordering countries? Or to other continents? What is the experience in areas where they have already occurred?*