Population and the Environment

- Population is concept that refers to the total human inhabitants of a specified area, such as a city, country, or continent, at a given time.
- Population study as a discipline is known as demography. It is concerned with the size, composition, and distribution of populations; their patterns of change over time through births, deaths, and migration; and the determinants and consequences of such changes.

- Population studies yield knowledge important for planning, particularly by governments, in fields such as health, education, housing, social security, employment, and environmental preservation.
- Such studies also provide information needed to formulate government population policies, which seek to modify demographic trends in order to achieve economic and social objectives.

- **The Dynamics of Global Human Population**

- More than 7 billion people currently inhabit the planet.
- The United States Census Bureau estimates that the current world population is about 7.121 billion.
- The US Census Bureau estimates the 7 billion number was surpassed on 12 March 2012.
- According to a separate estimate by the United Nations, world population exceeded 7 billion mark in October 2011, a milestone.

- The United Nations Population Fund identified the import of this in the unprecedented challenges and opportunities it poses to all of humanity.
- According to papers published by the United States Census Bureau, the world population hit 6.5 billion on 24 February 2006.
- The United Nations Population Fund designated 12 October 1999 as the approximate day in which world population reached 6 billion.
- This was about 12 years after world population reached 5 billion in 1987, and 6 years after world population reached 5.5 billion in 1993.

- In 1967, the world population was only 3 billion.
- It is estimated that every year about 135 million people are born and 55 million people die, adding 80 million to our global population.
- That's about one United States every 4 years, or 1 billion more every 12 years.
- Almost half of the global population is under the age of 25 and their decisions during their reproductive years will determine whether we have 6 billion or 14 billion people by 2100.

- The population of countries such as Nigeria is not even known to the nearest million, so there is a considerable margin of error in such estimates.
- Researcher Carl Haub calculated that probably more than 100 billion people have been born during the last 2000 years
- By 2050, the world's population will have grown by 2.7 billion to 9 billion.
- Most of this increase will be in Asia and Africa, which, along with the rest of the globe, will face increased strain on already insufficient resources.
- Sustained population growth, aggressive economic competition and increased consumption will result in intensive exploitation and pressure on resources (UNEP, 2009; OECD, 2003; DCDC, 2007).

- **Population –Environment Nexus**
- Two conferences organised under the auspices of the United Nations motivated researchers to begin to explore systematically the linkages between population and environment through data collection.
- These conferences were on:
  - Environment and Development, held in Rio De Janeiro in 1992; and,
  - Population and Development, held in Cairo, 1994,

- Theoretical and conceptual framework of current researches concerning population environment relationships are various, but they can be grouped in two distinctive categories (UN-DESIPA, 1994):
  - The Malthusian ("limits to growth); and,
  - The Boserupian ("cornucopian") perspectives: these imply the existence of direct relationships between population and environment, or between population, technological change and the environment.

- The Malthusian point of view suggests that limited natural resources place a restriction to population growth: environmental crisis must be interpreted as the natural mechanisms of compensation, limiting the population growth pressure.
- Boserup explicitly takes into account technological change, which Malthus did not. Population growth and the resulting increased population density might induce technological changes necessary to allow food production to keep pace with population increase.

- Ester Boserup's seminal book *The Conditions of Agricultural Growth,* which turned Malthus on his head by suggesting that it is not the growth of agriculture (food) that determines population growth but the reverse: population growth determines agricultural growth.
- Boserup (1965, 1976, 1980) discussed how, in response to greater population density and lower yields, farmers, who began as shifting cultivators, reduced their fallow periods and began to use the plough, manure, crop-rotation, irrigation, and multiple cropping to maintain and increase crop yields.

- **Features of Population Growth**
- ***Urbanisation***
- Most people will live in cities (OECD, 2003).
- By 2035, 60 percent of the world population will live in urban areas.
- Most cities in developing countries already experience difficulties providing basic services such as transport and waste treatment.
- New urban residents will increasingly inhabit areas that defy nature, such as low-lying coastal regions, and will be at significant environmental risk.

- ***Changing demographics***
- Although the global population is currently very young (half of the world's peoples are below 28 years of age), the overall global population is ageing.
- Most are found in developed countries; however, a third of the developing country population will be aged over 60 by 2050 and by 2050 nearly 80 percent of older people will live in developed countries.
- Some developing regions and countries, on the other hand, will witness an increasingly young population.
- Both trends will mean a shrinking working population, significantly altering the balance between economically-active and -inactive members.

- ***Persistent migration (Domestic and international)***
- The number of people living outside their country of origin is likely to grow to 230 million from the current 175 million by 2050 (DCDC, 2007).
- Migration will mostly occur between developing countries and will increase in response to environmental pressures, extreme poverty and natural disasters (OECD, 2003).
- These factors will be aggravated by the consequences of climate change, environmental changes, uneven distribution of wealth, the effect of disease and the inability of authorities to respond (DCDC, 2007).

- The availability and flow of energy, food and water will be critical. Resource challenges will intensify in areas where population expansion has the greatest impact, relative to local resources and economic growth
- Sub-Saharan Africa's population is likely to grow by 81 percent by 2035, 15 percent of which is likely to be under-nourished.
- Competition for resources of all kinds will intensify and the risk of humanitarian catastrophe will increase, in most vulnerable regions, because of climate change.

- ***Effects of Population Growth on the Environment***
- ***Population and Land Use***
- Population growth affects land use mainly through extensification and intensification of agricultural production.
- There is both historical and empirical evidence that different population densities and different population growth rates produce different land use patterns and changes over time.
- Analytically, more people need more food, which can come only from either expansion of agriculture into new lands, or efficient use of available land.

- ***Population and Water Use***
- With over a billion people lacking access to clean water today, further population growth at the low UN population projection, would put additional pressure on accessible water resources and reduce the per capita availability of clean water and increase the numbers of those without access.
- This is particularly so because 90 percent of the projected population increase is expected to take place in poor developing countries where only two thirds of the population have access to clean water and the capital resources for further water development and distribution are scarce.

- Furthermore, in poor countries, where half the population is lacking sanitation and sewage facilities, water supplies are contaminated by disease-bearing human waste, as well as agricultural and industrial pollution. Use of polluted water spreads diseases and results in high mortality and morbidity.

- *Population and Pollution*
- Other things equal, a growth of population results in growth of air and water pollution and solid waste.
- Some pollutants rise in direct proportion to population growth and others more slowly.
- The association between population growth and pollutant load is exemplified by New York City, where the population grew from 3 million in 1880 to 14.2 million in 1980.
- Waterborne discharges of organic carbon, nitrogen and phosphorus from human waste rose in direct proportion to population.

- Yet other developments, such as industrialization, large-scale agricultural development, and introduction of new products both complicate the picture and overshadow the effects of population growth.
- Cole et al. (1993), in a study of 42 rivers found a close correlation between the level of marine pollution from nitrates and the level of population in the watershed and predicted a 55 percent increase in nitrate levels as a result of doubling population.

- **Population and Deforestation**
- The relationship between expanding human populations and receding forests, especially in the tropics, has received considerable attention, since forests play a key role in water and soil conservation, wildlife habitat, biodiversity protection and the carbon cycle, as well as being a source of raw material for the timber industry and livelihood for local communities.
- Each year, 70 million people are added to world population, mostly in developing countries and 15 million square kilometers of forests disappear.
- This led many people to postulate a simple displacement-model of “more people, fewer forests” (Allen and Barnes 1985, Myers 1987, Ehrlich and Ehrlich 1990, and Rudel 1991), but deforestation is a complex and dynamic process in which the role of population growth is neither static nor monotonic.

- ***Population and Climate Change***
- According to an expert panel convened by the National Academy of Sciences to consider the implications of climate change in 1992, “The more people there are in the world, the greater is the demand put on resources to provide food, energy, clothing and shelter for them.
- All these activities necessarily involve emissions of greenhouse gases” (NAS 1992). Newell and Marcus found a 99.8 percent correlation between world population growth and growing concentration of carbon dioxide in the atmosphere during the period 1958-83 and called it the “nearly perfect” correlation.