

## Chapter 80

# Human Overpopulation: Impact on Environment

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### ABSTRACT

*Overpopulation has recognized as a global environmental problem since few decades, as it has caused a number of adverse effects on environment. Modern medical facilities and illiteracy in some interior regions of developing countries are the major reasons for development of this inverted pyramid demographic structure. Overpopulation has resulted in a series of catastrophic consequences by causing increased pressure on existing natural resources. Deforestation, effect on welfare, climate change, decline in biocapacity, urban sprawl, food security, increase in energy demand and effect on marine ecosystem are amongst most severe impacts of overpopulation. Concrete steps need to be taken on national and international level to combat the adverse effects of overpopulation, so that sustainability of natural resources can be ensured for future generations.*

### INTRODUCTION

The world's population has touched a mark of 7.3 billion in 2015 and could attain growth level of 9-12 billion before the year 2050 which suggest that the impact of overpopulation can increase the pace of ecological changes and impose a burden on biodiversity (Sala et al., 2000; UN, 2015). The 49 least developed countries have shown a growth rate of 2.3% annually, which was nearly twice as compared to the developing world i.e. 1.2% per year in the year 2009 (UN, 2009). Increases in human population

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## **Human Overpopulation**

size have caused an increased risk of synergies among impacts with resultant accelerated environmental degradation (Harte, 2007). This increase in population size has fastened the agricultural activities and technological development up to the extent, which is catastrophic to environmental health. The negative effect of an agriculture or technological society on the abiotic and biotic components of the environment can be expressed in the simplest terms, by the relation,

$$I = P.F$$

where P and F denotes the population and function, respectively which measures impact per capita (Ehrlich and Holdren, 1971). Thus, to reduce environmental degradation and to ensure sustainability of natural resources, better understanding of potential impacts of overpopulation on environmental and human health are required.

## **BACKGROUND**

An exponential growth of human population over the last few centuries has caused encroachment in the wild habitats and their consequent destruction, posing a potential threat to biodiversity components (Vinod, 2012). Growth rate of world population was approximately 2% per annum from 1960-2000, which indicted potential population doubling every 35 years thus could cause ecological unsustainability (Bloom, 2011). Projected world population growth for the major regions is presented in Table 1. Improved agriculture practices, modern medical facilities and illiteracy in rural regions caused demographic transition with more natality rate and decline in mortality rate. From 1980–81 until 1999–2000, agriculture showed a growth rate of 3.2% per annum, which exceeds the population growth rate of 2.0% annually over the period, while annual growth rate of per capita income was 3.1% between 1980 and 1991 and 4.3% since there forms of 1991 (Lal, 2006). According to the Inter Academy Panel Statement on Population Growth, several environmental concerns such as, elevated level of greenhouse gases, threat to biodiversity, climate change and environmental pollution are arisen as a result of rapid population growth (Coleman, 2011; Edet et al., 2014). This chapter reviews the impacts of overpopulation on environment, indicates future perspectives and provides some recommendation to combat the adverse impact of overpopulation.

## **IMPACTS OF OVERPOPULATION**

Overpopulation has severe environmental implications. Although it has contributed in the nation's economy at global level, but has caused some adverse impacts on environment, which need to be addressed (Figure 1). Table 2 summarizes evolution of environmental concern, associated with population explosion.

### **Deforestation**

Increasing urbanization has triggered deforestation at a very fast pace, in order to fulfill infrastructure demand of increasing population. Lands with high canopy covers are being subjected to deforestation and people are continuing to migrate from rural areas to urban areas. According to World Migration Report

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