

“Diminishing natural resources mean that population growth is the major global public health problem of the 21st century.”

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Introduction

“Coexistence between man and nature is a prerequisite for the future of humankind. Prosperity and the continuing development of society must be based on full recognition and sustained protection of the biological diversity of nature”

-- (Helsinki declaration 1994).

Current population has crossed 6 billion, with current fertility rate, the projected population number is 40 billion by the year 2100 (Hinrichson Don, 1994). Adequate natural resources are essential ingredients for balanced living of mankind. Imbalance in natural resources during the course of human life will have negative repercussions on various aspects. At present natural resources have reached their limitations and may not meet the requirement of unprecedented population growth. Natural resources are finite in capacity, if more people for limited resources are going to create imbalance. Renewable resources like water, fire wood and fresh water have reached to their ending phase (World resources 1992-93). There is greater imbalance than ever as a result of an unprecedented population growth. There is no doubt that the threat to health of population and declining natural resources is highly interlinked to population size and its usage.

Declined fresh water, land for agriculture, forest, air quality, increased greenhouse gases, shortage of food, fossil fuel energy, imbalanced biodiversity,,. Points out, how the natural resources are being reached to their limits. This essay mainly focuses on water, land, forest and fossil fuel as natural resources, their current situation and health consequences as a result of limitations of these resources for growing population. Although Water, land, forest, air quality, coastal ecosystem, biodiversity, climate conditions and many more natural resources are equally important and inter-wined to one another but to discuss all the natural resources are beyond the scope of this essay. Hence focus has been limited to water, land, forest and fossil fuel resources and health consequences because of the limitations of the same.

Natural resources

Water

Adequate quantity of water is an important integral ingredient of human life. Professor Falkenmark argues that the prime role of globally circulating water, the blood stream of biosphere, as the basic link support of human population (Population summit, 1993). But because of the acceleration of population growth quantity of water supply has reached to critical stage. Rapid population growth demands increased water supply and water is already depleting to meet the supply in many parts of the world (Postel, 1997). Approximately 60% of per capita availability of water has reduced between 1960-1997 and projected that per capita water supply would reduce further to 50% more from now by the year 2025 ((Hinrichsen, 1998). The situation worsens if the population size grows with current rate. Current water stress has reached to its critical stage where further stretching of population would lead to non availability of minimum quantity of water for basic requirements of human survival comfortably.

Quantity of fresh water

The burning and challenging issue is inability to meet the population requirement of freshwater. There is dramatic imbalance in fresh water supply as there is increased demand for surface water for agricultural and industry purpose. Ground water is also declining because of over use and mismanagement. As per UNEP report there is significant decline ground water as there increased use and slow recharge of ground water to meet the increased ground water tapping (UNEP, 1991). Ground water level has declined about 25-30 m during 1970s because of increased use for agriculture purpose (UNFPA, 1991). The result would be further reduction of fresh water quantity that threatens directly food sources eventually human health. Fresh water is just like energy resource where in inappropriate management would result in loss of water or disproportionate distribution, the end result would be chronic health consequences.

Quality of fresh water

Quality of fresh water is further threatened by increased water pollution because of growing population size. Since water is finite, growing population leading to increased organic waste production from human, cattle and from food industries. More and more waste and pollutants generated related to development sectors like mining, agriculture, metal pollutants, fertilizers, pesticides and other toxic substances(WRI 1991). The problem is much more serious among the nations who

have not implemented the water pollution control regulation measures. In India alone more than three thousand small and medium size towns have no or limited sewage treatment facilities (WHO, 1993). More than one hundred cities release untreated sewage and partially cremated bodies into River Ganges in India (NGS 1995). According to WHO 1992 report, nearly 95 % of water polluted in developing countries. More than just availability of fresh water, reduction of water pollution and adoption appropriate treatment regulations are essential to protect the health of current and future generation.

Public Health risks

Consumption of unclean water will lead to greater health risks. Water borne disease will crop up enormously; this will be great threat to human life.

The polluted water will be unsuitable for human consumption, neither for drinking nor for agriculture purpose (Nash 1993). Because of scarcity of clean water, nearly 90% of the diseases occurring in developing world (WHO, 1992). Majority of water and food contaminated disease, parasitic infection; diarrheal diseases are due to consumption of unclean water (Shetty, 1993). Unhygienic water supply and inadequate sanitation measures, takes life of 12 million people per year among developing countries (Hinrichsen Don and Bryant Robey, 2000). Protection of water from pollution is essential, more so to developing countries as they carry the risk of transitional states of health in the form of continued communicable diseases because of unclean water, nutritional disorder complex on one side and increasing non communicable diseases on the other side (Population summit, 1993). In short abatement of water pollutions in large scale is essential for creating sustainable fresh water quality to meet the requirement of growing population as enhanced population growth follows the increased demand for relative goods and services for everyone.

Land

Shrinkage of agricultural land

Globally there is shrinkage of land for agricultural purpose to meet the needs of growing population. To meet the growing population needs, food security and safety are essential. But land is finite natural resource; it can not stretch for needs of continued growth of population. Globally per year, 10-35 million hectares of land used for high ways and urban planning purpose and most of agricultural products comes from this land (Doeoes,1994). Globally, nearly 1.2 billion hectares of land lost the agricultural productivity since 1945 (Hinrichson, Don, 1994).

Therefore food security for growing population would pose greater challenge as there is limited land availability year after year. In brief shrinking of arable land is probably one of important reason for shortage of agricultural crops in the world.

Land degradation

Because of population explosion, there is intensification in land use, as a result degradation of land. Because of land degradation there is decline in natural chemical composition and soil surface resulting in threat to agriculture production, indirectly threats on food security (Myers 1992). Globally there is degradation of approximately 10 million agricultural lands (Pimentel et al., 1995). Around 15 to 30 % of reduction in agricultural production because of land degradation by 2020 (Buringh,1989). We are loosing the top soil approximately 18 times than replacement level, which is essential for good agricultural productivity (Pimentel et al., 1987). In short there is need for balanced soil with appropriate chemical composition for plant growth to have adequate agricultural crops but because of current situation it is looks impossible to have appropriate agricultural land for adequate crops.

Public health crisis

Food scarcity leads to chronic malnutrition related diseases and deaths more so among the developing nations. Approximately 10 million children lost their life because of nutritional linked disease alone in 1993 (Hinrichson Don, 1994). According to FAO estimation, in south Asia predominantly in India and sub Saharan Africa, nearly 528 million chronically undernourished population (FAO, 1992). Adequate food security is significant to meet the growing population. However we can strike the balance of food security for current population and land availability for agricultural crops provided if we decline the current population growth rate and reduce the degradation of land and optimal utilization of land keeping natural balanced soil composition.

Forest

Forest area is declining globally to meet the growing population needs of forest products. If the similar situation population size continues there will be serious consequence for minimum standards of living.

As mentioned in part two of this essay 'land', there is greater decline in land for arable land; more and more forest land (58 million hectares) encroached for agriculture purpose. Resulting in decline in forest land approximately 125 million hectares between 1971 and 1986 (Hinrichson Don, 1994). Further the deforestation

increased as majority of developing countries population depending for fuel wood. Around 16 million hectares of forest cut each year globally which eventually leading to exceed the requirement of forest products by 25% than current demand (Hinrichsen Don and Bryant Robey, 2000). Nearly 100 million people from developing countries have been deprived of fuelwood by the year 1990 (Hinrichson Don, 1994). Most of the developing countries depend on fuel wood for daily energy requirements example, 93% of Ethiopians, 90% of Somalia, 82% of Nigerians, 81% of Sudanese, 74% Ghanaians (Hinrichson Don, 1994) . To conclude the section, the forest area declining significantly because of more and more land used for agricultural purposes as mentioned in part two of this essay 'Land' and increased consumption (example fuel wood) by growing population. Further, decline in forest area indirectly resulting in decline of conservation of soil quality, increased soil erosion, this would lead long term disuse of the land for agricultural crops. The consequence would be; a) less food security and chronic diseases related to nutrition; b) large number of people who are depended on fuel wood to meet minimum daily energy requirements will be under greater threat for survival.

Fossil fuel energy

Fossil fuel such as gas, oil and coal are very essential for day to day modern life management on range of human and industrial productivities. There is greater decline in fossil fuel availability because of over consumption as the need of energy consumption increased with population growth. Fossil fuel contribute more than 90% of global commercial energy production. Approximately 70% of the fossil fuel burnt by the industrialized nations, who are having less than quarter of world's population(Hinrichson Don, 1994). World's 22% of the fossil fuel is consumed by 4% of United States population (Pimentel and Pimentel, 1996).As per the international energy annual 1995 estimates, 75% of world's population consumes 30% of fossil fuel energy (International Energy Annual, 1995). Since the year1955, in chain alone, there is 100% increase of the fossil fuel consumption for various industrial productivity (Wen and Pimentel, 1992). In short there is greater demand for energy than before because of rapid industrialization, urbanization and over consumption world wide (Pimentel and Pimentel, 1996). Although we can not drastically reduce the consumption of fossil fuel energy, small reduction in consumption and more dependent on renewable energy would be more appropriate strategy to gain the long term benefits.

Conclusion

To have minimum living standards; the limited natural resources not in a position to compensate with growing population size. We would be eventually going for higher and higher population density and will not be possible maintain minimum standard of living, as our living depends on the availability of natural resources such as water, land, forest, energy resources. We are convinced that the current population size exceeding limits beyond the availability of natural resources for human needs. Limitations of natural resources would pose pandemic health challenges such as malnutrition attributable diseases, increased water borne diseases, declined basic living requirements like fuel wood, fossil fuel consequently declined living standards. Hence, we need to develop the strategies to address the water conservation, waste water treatment and use, efficient use of land, proper environmental policies to preserve and sustain the water quality, air quality, soil and biological resources and slow migration from dependence on fossil fuel to self sustaining solar energy. Finally develop and implement sound energy conservation policies across the world.

How ever the efforts the population has to be stabilized, current population could be maintained and reduce further addition of population by various personal and population policy interventions. With balanced, concerted effort across the nations, we could bring gradually changes in population level to manageable levels.

Nevertheless the human thinking and understanding of the natural resources and human living importance has to be underscored. The human behavior and attitude need to be changed towards natural resources usage and change current practices. Proper education to every one is essential coupled with fair population control, appropriate resource policies supported by research evidence; we shall be able to strike the balance of public health threats posed by explosion of population and limitation of natural resources at large.

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