

Human Population and Environment: Effects of Population Growth, Climate Changes and Poverty Relationship

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Abstract

In this review article we have tried to explain the impacts and effects of human population's growth on the environment. Different factors which plays a vital role are been discussed in detail. The factors such as population growth, environmental degradations, poverty and effects of climate change are been explored. Apart from these we have explained the consequences of exponential human growth on various day today's demands such as food, land, water and other essentials commodities. Despite notable limitations to current knowledge on links among population this article will help to understand the major impacts of numerous influences of human population on environment.

1. Introduction:

The world's population of nearly one billion in 1800 has grown to approximately 6.9 billion today, and population projections suggest that the world population will fall somewhere between 7.5 and 10.5 billion by 2050, depending on changes in national level fertility and mortality rates. All of the world's net population growth over the coming 40 years will occur in cities in less developed countries [2].

At the same time the ecosystems that support people's livelihoods and well-being are being rapidly degraded. The recently completed Millennium Ecosystem Assessment examined 24 critical ecosystem services upon which humans depend for their well-being and found that 60% were being degraded or used unsustainably. The impacts of degraded ecosystem services are being disproportionately borne by the poor, are a principal factor contributing to poverty, and are a barrier to achieving the Millennium Development Goals set by the United Nations [2].

Population growth is identified as one of the key indirect drivers of the degradation of these ecosystem services. Population growth itself, however, remains an insufficient explanation of the relationship between population, ecosystems, and poverty. Increases in human population size have dynamic, non-linear impacts on the environment, with feedbacks, thresholds, and synergies amplifying risk and speeding environmental degradation beyond the rate of population growth.

Two of the greatest concerns of our generation are to improve human welfare and to prevent the ongoing loss of biodiversity. More than one billion people live in extreme poverty and hunger, and ecosystems are losing species at rates only seen in previous mass extinction events. Unfortunately, overcoming these problems remains difficult, and if anything, Progress appears to be leaning in undesirable directions. Because of a plethora of human related stressors which affect 83% of the world's land surface biodiversity remains in a downward trend, with an increasing number of species being threatened by extinction. In turn, the world's human population has reached 7 billion and could grow to

9-12 billion before the year 2050, indicating that the effect of human stressors upon biodiversity will likely continue to increase and that in the coming half century we are likely to witness accelerated ecological changes and the erosion of important biodiversity goods and services. The sharp contrast between the declining supply of the Earth's services and the rising demand from a growing human population indicates that such services will increasingly fall short, thus exacerbating hunger and poverty; unfortunately, reversing ongoing deleterious trends in human welfare and biodiversity remains challenging despite international initiatives such as the Millennium Development. The goal of this paper then is to further describe the complex relationships among human Population growth, environmental degradation, and poverty, and its potential feedback's with climate change. The review begins with a discussion of several theories on the relation between population growth, environmental degradation, the impact on human well-being, and its impact on climate change. Poverty is then discussed in more detail as both a contributing factor to and consequence of population growth and environmental change.

2. Effects of various factors of human populations on Environment.

It has been seen that different factors plays a vital role of human populations on Environment. It is mandatory to study the each factor and related effects for in depth understanding the effects and which may help to overcome the hazardous effects.

2.1. Population Growth and Its Variation:

The issue of overpopulation is fading in importance throughout most endeavors and sectors of society. For example, overpopulation, despite being directly or indirectly linked to the Deterioration of ecological system and a key factor for the success of conserving species and ecosystems has been rarely considered and in fact "Trivialized or ignored" by much of the conservation biology community (For example, it is often argued that increasing greenhouse gas emissions are caused by combination of excessive consumption and increasing population. In fact, projections on human population suggest that the net production of greenhouse gases could be equivalent between developed and developing countries due to the large consumption of the former and the large population growth of the later. Yet the most authoritative report on climate change makes little to no Reference to the issue of population growth or family planning, or any related matter. Similarly, one could argue that food security will depend not only on our capability to produce more food but on how much food our population will continue to demand; yet some of the most seminal recent reports on food security lacked any reference to the role of or need to address population growth in ensuring current and future food security . Finally, overpopulation is known to affect key aspects of human welfare (reviewed in Window of opportunity for tackling overpopulation: Welfare, However, the topics of overpopulation and family planning are rarely considered by leaders in different endeavors as mitigation solutions to improve the health of impoverished people, and population growth is "marginalized" in key recent reports about improving human welfare. It is very likely that population growth as a missing scientific agenda accounts in part for the reduced public knowledge and interest in this issue. Meffe introduced the concept of "missing awareness" to explain a current lack of understanding of the magnitude of our population even among portions of our society with higher education. In the United States, public opinion on population growth as a pressing problem declined from 68% in 1992 to 8% in 2000 and does not appear in recent opinion polls Despite the

significance of the recent milestone that our global population reached seven billion people, the press coverage faded quickly, particularly when compared to more trivial news at the time (e.g., the possible love affairs of Herman Cain, which lasted for weeks). Unfortunately, the limited public consideration of the issue translates into limited policy action. As an example, the share of international funding on family planning has dropped to 5% in 2007 from 55% in 1995. This collision between lack of interest in the topic of population growth (by scientists and the public) and the declining support for family planning programs and addressing population growth among developed countries generates a worrisome situation for the spontaneous stabilization of the world's human population.

Although the relevance of population growth can vary by country, especially among developed and developing countries, interest in the topic should be a global concern as even developed countries appear to be reversing their negative population birth rates and because interest in the topic among developed countries greatly determines the success of education and family planning programs in developing nations.

However, this is not to say that overpopulation is solely restricted to developing countries. As an example, former presidential candidate Mitt Romney, age 66, recently released a family photograph of him with 20 of his 22 grandchildren. If every child chooses to have the same number of children their parents and grandparents did, by the time that Mitt Romney is in his 90s, he could potentially be taking a photograph with ~97 great-grandchildren, which added to the 22 grandchildren and the 5 children adds to ~124 people from two parents. Several other candidates in the last U.S. election have 5 to 7 children.

Population and Explosion:-

- It can lead to depletion of resources
- Severe competition for food and space
- Increase in psychological stress and strain
- Rapid pollution of environment
- Large scale unemployment
- forests are cut, oceans are exploited and the entire natural equilibrium gets disturbed
- A growth human population first faces the problem of food, shelter and socioeconomic problems
- It is the very great and continuing increase in human population in modern times

2.2. Impact of climate changes:

The recent temperature record shows that our climate has warmed and that weather extremes are becoming more frequent and catastrophic, leading to costly damage of infrastructure and loss of human life. If one accepts the overwhelming body of evidence linking ongoing climate change to burning fossil fuels and agricultural practices, then one can safely argue that climate change is a by-product of supplying human demands; thus, overpopulation is a key component of projections in carbon emissions. It is often argued that climate change could be alleviated by reducing our carbon footprint through less consumption and better technology. However, the unsustainability of ongoing growth in human population can overwhelm those efforts; thus, definitive solutions will require not only smaller footprints, but fewer feet. For instance, if a given individual were to implement an extensive list of actions known to reduce greenhouse gas emissions that

reduction would still be about 40times smaller than the emissions generated if this person were to have two children. In the United States, each child adds about 9441 metric tons of carbon dioxide to the carbon legacy of an average parent, which is 5.7 times his/ her lifetime emissions .Achieving a reduction of greenhouse gases will become increasingly difficult even under modest population growth rates given expected improvements in human welfare and expected increases in energy consumption.[6]. Fig. shows the effects of climate change on environment such as temperature which ultimately leads to global warming. The various impacts of global warming such as air pollutants, heat, storms and flooding etc. have their strong impacts.

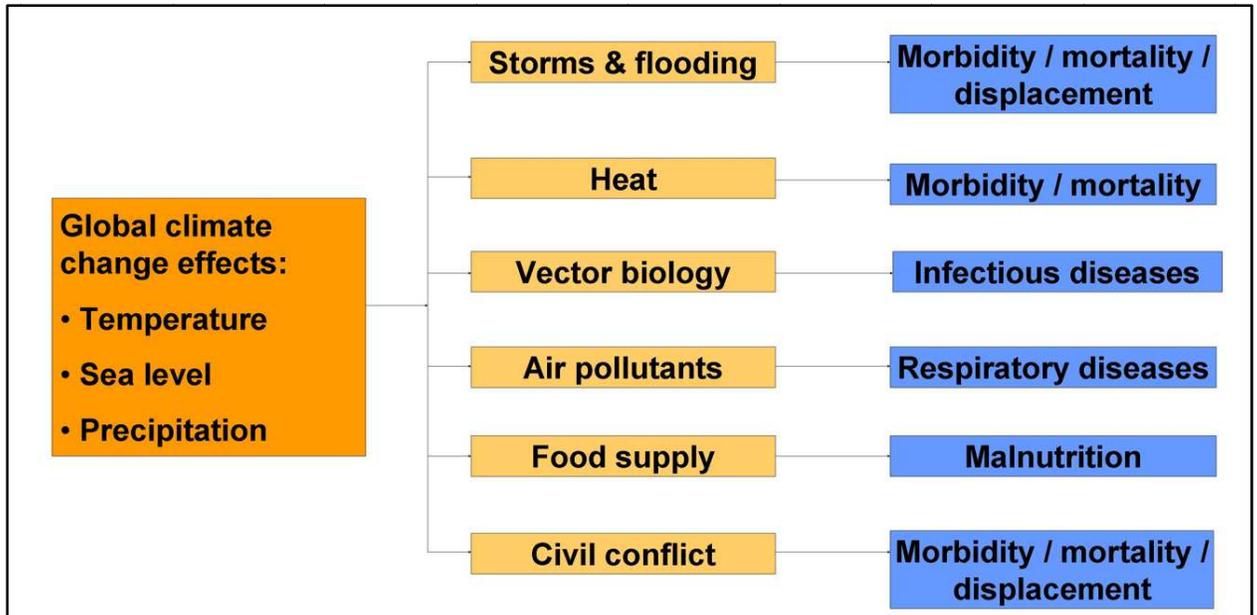


Fig. (a) Effects of climate change on due to exponential growth of human populations on environment.

2.3. Effects of POPULATION POVERTY RELATIONSHIP:

The understanding of population, poverty, and environment relationships have demonstrated that the framework can be applied to assess a vicious circle model (VCM) of population, poverty, and environment [Fig.2.]. According to the VCM, positive feedbacks at the household level among population growth, poverty, and environmental degradation lead to a downward spiral for poor households. The VCM concept of multiple feedbacks is useful and encourages examination of not just how population growth impacts on the environment, but also how population growth affects poverty, poverty affects population growth, poverty affects environmental degradation, environmental degradation affects population growth, and environmental degradation affects poverty. The importance of this feedback cycle and its contribution to climate change will be examined here relative to direct impact on the natural resource base. Human modification of land cover accounts for approximately 35% of the anthropogenic contribution to CO2 emissions [2].

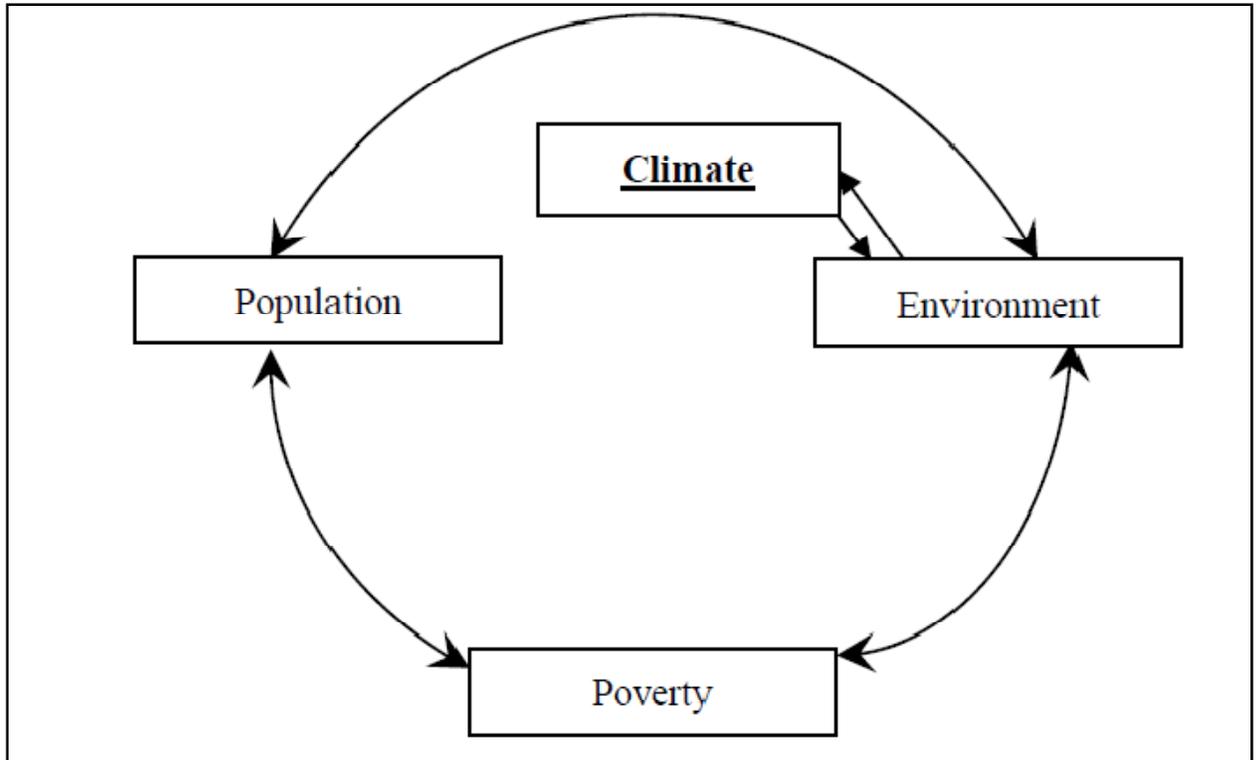


Fig.2 Vicious Circle Model

3. Solutions: Theoretical and Practical

In terms of the problem of feeding the world, for example, technological fixes suffer from limitations in scale, lead time, and cost. Thus potentially attractive theoretical approaches—such as desalting seawater for agriculture, new irrigation systems, and high protein diet supplements—prove inadequate in practice. They are too little, too late, and too expensive, or they have sociological costs which hobble their effectiveness. Moreover, many aspects of our technological fixes, such as synthetic organic pesticides and inorganic nitrogen fertilizers, have created vast environmental problems which seem certain to erode global productivity and ecosystem stability. This is not to say that important gains have not been made through the application of technology to agriculture in the poor countries, or that further technological advances are not worth seeking. Enhances tetra genic effects of heavy metals. And our distaste for lung diseases apparently induced by sulfur dioxide inclines us to accept the hazards of radioactive waste disposal, fuel reprocessing, routine low-level emissions of radiation, and an apparently small but finite risk of catastrophic accidents associated with nuclear fission power plants. Similarly, electric automobiles would simply shift part of the environmental burden of personal transportation from the vicinity of highways to the vicinity of power plants. We are not suggesting here that electric cars, or nuclear power plants, or substitutes for phosphates are inherently bad. We argue rather that they, too, pose environmental costs which must be weighed against those they eliminate. In many cases the choice is not obvious, and in all cases there will be some environmental impact. The residual per capita impact, after all the best choices have been made, must then be

multiplied by the population engaging in the activity. If there are too many people, even the most wisely managed technology will not keep the environment from being over stressed. In contending that a change in the way we use technology will invalidate these arguments, Commoner claims that our important environmental problems began in the 1940's with the introduction and rapid spread of certain "synthetic" technologies: pesticides and herbicides, inorganic fertilizers, plastics, nuclear energy, and high-compression gasoline engines. In so arguing, he appears to make two unfounded assumptions. The first is that man's pre 1940 environmental impact was innocuous and, without changes for the worse in technology, would have remained innocuous even at a much larger population size. The second assumption is that the advent of the new technologies was independent of the attempt to meet human needs and desires in a growing population. Actually, man's record as a simplifier of ecosystems and plunderer of resources can be traced from his 1216 probable role in the extinction of many Pleistocene mammals, through the destruction of the soils of Mesopotamia by salination and erosion, to the deforestation of Europe in the Middle Ages and the American dust bowls of the 1930's, to cite only some highlights. Man's contemporary arsenal of synthetic technological bludgeons indisputably magnifies the potential for disaster, but these were evolved in some measure to cope with population pressures, not independently of them. Moreover, it is worth noting that, of the four environmental threats viewed by the prestigious Williamstown study as globally significant, three are associated with pre 1940 technologies which have simply increased in scale [heavy metals, oil in the seas, and carbon dioxide and particulates in the atmosphere, the latter probably due in considerable part to agriculture. [5].

4. CONCLUSION

In this paper we have tried to explain the how increasing population growth, poverty, and environment relationships to climate. Our understanding of these relationships has progressed greatly from the original Malthusian roots, yet still today few generalizations can be made unambiguously. Research has demonstrated across multiple scales that population environment poverty synergies tend to be non-linear, ecosystem specific, and involve multiple pathways among population and environmental change, population and poverty, and poverty and environmental change. Furthermore, in most cases population growth's relation to poverty and the environment is mediated by various types of capital available to households and institutions, culture, and social relations. Human tropical forest system to illustrate some aspects of the vicious cycle model. Human population is finite and it needs to deep study and research on its control and to control impacts of human population on earth.

REFERENCES:-

1. John Harte (2007), "Human population as a dynamic factoring environmental degradation", *Popul Environ*, 28:223– 236.
2. Jason Bremner (2010), Population, poverty, environment, and climate dynamics in the developing world, *Interdisciplinary Environmental Review*, Vol. 11, Nos. 2/3.

3. Dr. Mashhood Ahmad Khan (2011), Environmental Pollution: Its effects on Life and Its Remedies, International Refereed Research Journal, II (2), 276-285.
4. Catherine Marquette (1997), "Population and Environment Relationships in Developing Countries", 1-19.
5. Paul R. Ehrlich and John P. Holdren (August 2011), "Impact of Population Growth", *Science*, 171, 1212-1217.
6. Camilo Mora (2014), revisiting the environmental and socioeconomic effects of population growth, *Ecology and Society* 19 (1): 38.
7. Bilsborrow R. (1992), Population growth, internal migration, and environmental degradation in rural areas of developing countries, *European Journal of Population*, 8, 125-148.