DEVELOPMENT, ENVIRONMENT, BIODIVERSITY AND THE SIXTH GREAT EXTINCTION

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*[**Abstract**: In its 14th September, 2013 issue, The Economist has recognized that technological progress and economic growth have allowed man to dominate the planet and in the process has been responsible for wiping out much of the mega fauna that once dominated the planet. Technology allowed man to kill creatures and chop down forests more efficiently and to produce enough food to sustain seven billion people. Resultantly the rate of extinction of species has been phenomenal because of man's such activities. The report does recognize the complexities of ecosystems as well as their importance for human welfare and is appreciative of the fact of interdependence of flora, fauna, microbial life and morphology to sustain life on the planet Earth. It recognizes that much of the loss of species is irreversible and there have been felt effects of such losses. Finally, it is concluded that as the economic growth takes place beyond a threshold; developed economies develop interest in restoring the damage caused to the environment because their populations have time and leisure to bring about pressures on their governments to place regulations in place and take upon restoration activities. Thus it would suggest increased economic growth as a strategy to avert the march to sixth great extinction, which is being perceived by some groups on the horizon. This discussion Paper is towards pointing out that unless the international community learns to curb consumption and defines difference between essential needs, wants and luxuries and brings out paradigm shifts in the framework of its concept in economic growth, it would be wishful to imagine that march to the sixth great extinction would be averted.]*

"Over the past few centuries mankind's economic growth has caused many of the problems that other species face. But as our special report this week argues, greater human prosperity now offers other species their best chance of hanging on"[1]

Special report of The Economist referred to above acknowledges that technological progress and economic growth have allowed man to dominate the planet and in the process has been responsible for wiping out much of the mega fauna - giant elk, aurochs, marsupial lions - that once dominated Earth. Technology allowed the man to kill creatures and chop down forests more efficiently and to produce enough food to sustain seven billion people. As a result, over the past few centuries extinction of species is estimated to be around 100 times the rate they would run in his absence. The report argues, that when people start to reach middle - income levels, other species stand to benefit. As people become richer, their interest transcends

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1 The Economist, p.11 September 14, 2013.

necessities towards beyond and some seeking to restore the damage that is being caused by humans in the pursuit of economic growth. Such groups bring pressures on governments to pass laws to constrain companies from damaging the environment. Growth, it is argued, also has indirect benefits for biodiversity. Sewage treatment plants and campaigns for keeping the rivers clean help other species. Empirical evidence has been cited in the report to suggest that in rich countries conditions for other species are improving. Living Planet Index, an indicator of biodiversity, has been on the rise over the past 40 years in temperate (generally rich) countries and fallen in tropical countries (generally poor) ones. The report concludes that more progress, better productivity in farming through GM seeds and the related protocols and addressing climate change issues would avert the sixth great extinction.

Special report of The Economist is nothing but the restatement of the well-known Environmental Kuznet Curve (EKC) hypothesis around which a sizeable literature grew in the nineties of the last century. The common point of all these studies is the assertion that the environmental quality deteriorates at the early stages of economic development/growth and subsequently improves at the later stages. Evidence of the existence of the EKC has been questioned from several corners. Only some air quality indicators, especially local pollutants show the evidence of EKC and in relation to other agents its validity is not established. Even in relation to particulate matters, its validity is not universal. A variety of pollutants follow either monotoxicity or N-shaped curve. The world wide emission prospects are not optimistic as it might be expected on the basis of EKC results. According to EKC hypothesis, the improvement in environmental quality are not attainable for majority of the world populations living substantially below the estimated turning points. Thus, worldwide emissions are expected to continue to increase due to economic growth. Economies may exhibit initially inverted U-Curve but beyond a certain income level, the relationship between environmental pressure and income turns positive again. The levels of aggregate material consumption over time may show an N shape rather than an inverted–U shape. EKC relation also does not hold good for total industrial water pollution and toxic pollution. The concept of EKC cannot be applied to all

environmental factors. For example, land - use change and for biodiversity loss, which are irreversible, are conceptually different from air or water pollutions[2]. Some have speculated that by exhibiting improvements in environmental quality through economic development may in reality be indicators of increased ability of consumers in wealthy nations to distance themselves from the environmental degradation associated with their consumption[3]. The fact remains that on more consumption based measures, Co_2 emissions and municipal waste, show no tendency to decline with increasing per capita income. Even in the U.S., after three decades of regulations, coal fired plants are estimated to cause between 10,000 to 30,000 deaths annually, due to emission of SO_2, NO_2 and particulate matter[3a].

Report of The Economist re emphasizes lurking doubt in the minds of professionals that earth is currently faced with mounting loss of species that threatens to rival the five great extinctions of the geological past; caused by man. As back as in 1993, Harvard biologist F.O Wilson estimated that earth is currently losing something on the order of 30,000 species per year i.e. @ 3 species per hour and some biologists have begun to feel that this biodiversity crisis is severe and points towards journey to the sixth extinction[4].

The growth models centred around economic theories alone have come face to face with ecological sustainability and in the knowledge that the earth has limited resources and there is interdependence of life systems and the delicate balance of ecosystem[5]. James lovelock in his book propounded the Gaia Hypothesis after the Greek Goddess Gaia (The Earth) and stated Gaia as:

[2] Environmental Kuzents Curve Hypothesis: A survey. Soumaya Nanda Dinda www.sceincedirect.com

[3] Environmental Kuznets Curves-real progress or passing the luck? A case for consumptions based approach; Dale's . Rothman; Ecological Economics 25 (1998) 177-194.

[3a] The health effects of Coal electricity generation in India by Maureen Cropper et al. Discussion paper, June 2012, RFF DP 2-25. Resources for the future.

[4] The Sixth Extinction, Niles Eldredge, an action bioscience. Org. original article.

[5] Can humankind change economic myth? Paradigm shifts necessary for ecological sustainable business by W. Edward stead and Jean Garner stead, East Tennessee State University, Johnson City, Tennessee USA.

> "---- a complex entity involving the Earth's biosphere, atmosphere, oceans, and soil, the totality constituting a feed back or cybernetic system which seeks an optimal physical and chemical environment for life on this planet"[6].

Inherent in this explanation is the idea that biosphere, the atmosphere, the lithosphere and hydrosphere are in some kind of balance - that they maintain homeostatic condition similar to the way human body system is maintained; oceans and rivers are Earth's blood, the atmosphere is the Earth's lungs, the land is the Earth's bones, and the living organisms are the Earth's senses. If Earth's mass is fixed, the Earth must recycle elements to make them available for other processes. Otherwise, the whole system would rundown and Earth would be like a moon i.e. unlivable. Living organisms are a vital part of these cycles. These living organisms are a vital part of such recycling such as carbon cycles, the nitrogen cycles and the sulfur cycle[7]. Economic growth particularly since 1950 has been spectacular and the man has forayed in diversified scientific fields which, *interalia*, have made him realise that in this race of economic growth he has been messing up with environment, ecology and biodiversity generally threatening his very existence. It may require sensitive and perceptive minds to visualize that even the smallest life on the planet performs a vital role in maintaining the delicate recycling processes in nature. Report of The Economist cites - the phenomenon of the disappearance of sparrows in China becoming cause of famine there in 1960 that killed 20 million people was too obvious to be missed. Many negative effects of wreckless activities carried on in the name of development have come to be recognized by commoners and policy makers alike. Many setbacks are irreversible particularly which result in disrupting natural processes governing the living organism which finally may result in loss of productivity (in the way of loss of honey bee colonies in the developed U.S. as cited in the report of The Economist) and such setbacks cannot go unnoticed because of the adverse impacts brought on several workers by way of reduced wages and also damage to ecology. Another obvious loss as cited in the report of The Economist is the potential astronomical and irreversible loss to the pharmaceutical industry as the

[6] The Gaia Hypothesis by Sean Chamberlin bibliotecapleynades.net/gaia/esp.gaia01.htm
[7] *Ibid*.

source of natural products of the present and the future are being annihilated because of the dwindling of species at alarming rates. Such phenomenon would also weaken the capacity of the man to deal with new types of afflictions it would suffer from as the ecological balances are altered as a bye product of economic growth. It is being acknowledged in the report of The Economist that a human body itself is a large colony of different species nurturing a large variety of bacteria inside each of these species and their interactions with the food intakes and air inhaled are complex and crucial to the production and maintenance of life and advises that humans would be wise to show humility in their dealings with other species, even when they are invisible to naked eye. Scientific efforts of reversing the aftermaths of developments such as afforestation might appear impressive but restoration of ecological value and ecological equilibrium is open to doubt. As far as biodiversity is concerned, imbalances brought about by the human interference tend to be irreversible adding to the deficit being created by the forces of development both in the developed and developing countries.

Yet without proposing a paradigm shift in the processes and theory of ongoing economic growth; report of The Economist pins its solution for averting the sixth great extinction on more progress citing improvement in population of certain species as result of efforts by human intervention and in the same breath acknowledging that some such efforts do not necessarily restore the ecological balance. It needs no over emphasis that such an approach is an advocacy of continuing approach to economic growth and thus would far from averting the sixth extinction would bring it closer.

Man, as a specie, has been living outside the nature since it took to agriculture when it declared war on ecosystem - converting land to produce food crops, with all other native plant species being its enemy in the form of unwanted weeds. Similarly all animals, barring which were capable of being domesticated, were categorized as pests and beasts. Agriculture as it progressed brought about imbalance among species when ‘human’ as specie came to dominate other species and its increased population size is testing the carrying capacity of the planet at the present juncture.

The continuing growth in human population, in the post-industrial revolution years of the past two and half centuries, coupled with unequal distribution and consumption of wealth on the planet has set in a vicious cycle: more lands are being cleared, higher fossil energy is being consumed, over harvesting of natural, living and non-living resources; all detrimental to species and microbial life besides resulting in increasing pollution[8].

The fact that during the course of economic development the world's ecosystem has been messed up is being recognized including by the report of The Economist. Conservation measures and sustainable development have been suggested as ameliorative measures. Such strategies may succeed only if consumption patterns are also re ordered to be within the carrying capacity of the plant and also within its recycling efficiency. It is not uncommon to come across in literature assertions such as "business needs to clean up its act in order to help save the planet" without realising that planet can take care of itself; it is humankind's way of life that is threatened. Historically, in the aftermath of major extinction spasms, it is whatever has caused the extinction event has dissipated. That cause, in the case of the sixth extinction, would be Homo sapiens and the march towards that end has been with efficiency and expediency associated with the dominant and intelligent specie within a small span on geological scale since this specie started staying out of nature after taking to agriculture and followed by industrialization. For decelerating the journey to extinction, the Homo sapiens need to reorder their behaviour towards the global ecosystem. It needs no emphasis that the planet can take care of itself; it is humankind's way of life that is threatened. The way technology is being deployed in messing with nature, its white-hot rash, in the end, may prove destructive for our own species and yet as in the past life on the planet may continue for species who would be capable of surviving the emerging ecosystem.

For aligning the concept of economic growth to be compatible with the limited capacity of the earth and its interdependence of life systems, and the delicate balance of ecosystem, all the social institutions would have to undergo shifts which

[8] *Op. cit.* 4

encourage them to view themselves as part of a larger, interconnected, social and ecological network governed by biological and physical processes. Such shifts would require reappraisal of values which underlie their relationship with the larger ecosystem. Eventually, a consensus is to emerge defining 'How much economic activity is enough? As such a concept is fleshed out, it would blow up the possibility of a sustainable economic system within the framework of increasing profits and economic growth as the growth and profits would get defined by the capacity of the economic wealth that earth can afford which would put a ceiling on how much is enough.

Such shifts would require integration of economic, biologic and human systems creating an interdependent method of commerce that supports the further existence of the man. Economic system that would emerge would thus be in total rejection of traditional economic theory considering the economic system to be a closed circular - flow of goods and services between business organisations and households which is virtually independent of the planet where these activities take place. Economy would be a subsystem of the larger social system and ecosystem powered and maintained by through puts of energy and materials system and thus would be developing on an understanding that unlimited growth on a finite planet would be an impossibility. Unlimited growth assumption would give way to assumption of enoughness. In such a steady state economy, economy develops but does not grow and land would cease to be a substitute for manmade capital and would account for long term consequences related to natural resource depletion. Such a shift can cause the emergence of a society of planet, an all - inclusive, worldwide community based on values of planetary responsibility rooted in peace, justice and deep ecological awareness[9]. Economic system and management structures would be around developing unity with larger society and ecosystem and thus would redefine concepts of gross domestic product, environment friendly technology development, dissemination and adaptation and restructuring the tax system and international trade regimes.

[9] *Op. cit.* 5

Despite the lurking horizon of the sixth great extinction, there seems to be little evidence of taking even the first step towards the paradigm shift i.e. curbing consumption by making distinction between basic needs and wants[10]. Rather there seems to be maddening race among the international communities for increasing consumption in the scenario of hoping that technology innovation and human ingenuity and enterprise would keep finding answers to the menace of extinction as economy develops to feed increasing consumption levels. It appears that the international community is rushing towards the path of bringing the date of extinction closer. After all, the humans have done exceeding well in managing to bring the present scenario of degradation in relatively small span of 12000 years since they adopted agriculture and have picked up remarkable speed during last 250 years i.e. since the beginning of industrialization and now they are poised for further take off with newer fuels and powerful I.T tools. Usual response of the economists and political managers has been in the concept of sustainable development which is to be achieved through fiscal measures and property restructuring measures without bringing about meaningful curbs in consumption and also without regard to the carrying capacity of land and the planet in general. Reality remains that international systems as they stand are not capable of bringing about the desired paradigm shifts. Like all dominant species in the past who themselves were the cause of their own disappearance by creating shortage of species on which they preyed; humans would also search their end to give way to another set of species who would be capable of surviving beyond the next extinction.

[10] Resources, environment and economic development, a brief history of economic growth and environment.