

Covid-19 Pandemic, Gaia and Its Sustainability

Soumyendra Kishore Datta^{1*} and Piali Bandyopadhyay Datta²

¹Prof of Economics, Burdwan University, India

²Associate Prof of Economics, Burdwan Raj College, India

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***Corresponding author:** Soumyendra Kishore Datta, Prof of Economics, Burdwan University, India

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Abstract

The recent pandemic is a reflection of the fury of the Gaia, the mother earth. Human have recklessly plundered fossil fuel resources, depleted forest, dislocated aboriginal people from their natural homestead, carried out frantic urbanization, extended its hand to wildlife leading to destruction of the natural balance and biodiversity. The appearance of the virus is considered the nature's negative feedback to turn the things right. According to living planet report (2010), our unconcern about the Gaia has exerted several great direct pressures on the biodiversity and ecosystem services.

Continued flow of diverse ecosystem services requires investment in natural capital resources. However sustained well-being of the humanity requires positive investment not only in the natural capital but also in human capital. Majority of the rich/populous countries have so long allocated huge chunk of budget towards defense and military expenses to the neglect of expanding facility of health infrastructure, medical services and insurance to rural and informal sector workers. Further after the cessation of the pandemic the environmental pollution may shift to pre-pandemic state. So we need to learn from the assault on Gaia and its negative feedback on us and hence be proactive to reverse it.

Keywords: Virus; Gaia; Sustainability; Environment; Capital; Health

Introduction

The recent worldwide COVID-19 pandemic has made us confront with the fury of GAIA, forcing us to introspect, to reverse the unbridled nature of consumption in taking pleasure from the material world. Can 7.8 billion population sustain in the culture of consumerism, with rampant industrial activities in the pursuit of go as you like actions, putting pressure on the ecological and environmental balance of the earth? It seems in this context pertinent to mention that in order to enjoy a lavish life and promote its own wellbeing, human have recklessly plundered and used fossil fuel resources, depleted forest, destabilized biodiversity, undertaken rampant industrialization, vitiated the environment, dislocated the aboriginal people from their natural homestead, carried out frantic urbanization with proliferation of slums, merrily increased its own number in order to rule over the nature and in order to satisfy rising food needs, extended its hand to wildlife leading to destruction of the natural balance and biodiversity.

The last case is manifest when it is seen that the genesis of the virus can be apparently traced to the wildlife market in Wuhan (China) where trade in bat flesh is considered to be its carrier. Not only this, many other wild species like snake, frog, birds, pangolin etc constitute regular items of trade in this region. Usually the viruses are kept in check by healthy environment with diverse and abundant wildlife. But when forests are ripped and biodiversity is destroyed, virus leave out from their natural quarantine and cause disease like covid 19 with profound health and economic impact in both rich and poor countries. Similar case was noted in case of Ebola virus in Gabon, Africa when a chimpanzee was hunted by local people in nearby forest and eaten.

A terrible fever attacked them within hours killing many on the spot while some other died on the way to hospital [1]. It is actually human interference into the biodiversity that creates condition for unleashing of new viruses and uncertainties about the sustainability of human race. According to Quammen D [2], 'We invade tropical forests and other wild landscapes which harbor so many species of animals and plants-within those creatures so many unknown viruses'. When the trees are cut or animals killed for eating or selling their flesh in the market, the viruses are let loose from their natural hosts and search for new hosts for their own survival. According to Jones BA et al. [3], these zoonotic diseases are caused by environmental change and human intervention. Hence it is very likely that with growth of population, spread of urbanization and increased human craving for different goods and more food, activities like construction of road, mining, hunting, logging etc lead to bring human beings into closer contact with animal species, release of the virus and resulting pandemic. According to her, land use change, destruction of landscapes and degraded natural habitats are likely to carry more viruses that may infect humans. As urban areas proliferate and population grow, more of such animals are likely to come closer to human being with increased potential to loosen pathogens.

The appearance of the virus at this juncture hence came to be termed by many [4,5]. As the nature's negative feedback to turn the things right. In the words of R.C Gatti-the planet has become sick of us and now it tries to make us sick. The pandemic is the aftermath of GAIA's proactiveness to self-regulate its system or a mere coincidence at this hectic hour of human existence, In this context it seems imperative to focus on several issues including human indifference to the health of the Gaia, dis-balance caused to it, health factors linked with sustainability, several aspect related to covid-19 issues and possible environmental concern lingering afterwards.

Gaia: The Natural Capital

"Gaia" stands for the 'mother earth' named after the Greek Goddess. The Gaia refers to the super ecosystem, a combination of varied micro ecosystems like oceans, rivers, ponds, forests, mountains etc. containing diverse biotic and a-biotic resources. Its unique quality is the Self-regulating and Self-sustaining mechanism. The entire ecosystem covering all these are systematically governed by the ideal composition of various gases, water vapor etc. and which produces temperature, precipitation that made life on earth possible. Existence of life is maintained because of the natural laws of interconnected actions and reactions of the living organisms. There is a constant balancing interaction and feedback loop operative among different species of living objects such that condition supportive of life is dynamically maintained. Back in 2003 Lenton et al. [6] wrote (a) Although there is a state of thermodynamic atmospheric disequilibrium owing to the activities of life, the aspects of its composition are remarkably stable. (b) The conditions at the surface of the Earth are usually at the near optimal state for the dominant organisms (c) Life has persisted for over

3.8 billion years despite increasing solar luminosity and variable exchange of matter with the inner Earth. (d) The Earth system has time and again revived through self-regulating mechanisms from enormous disturbances.

We are Living in a Gaia-Blind Society

Wanton extraction of natural resources to meet rising human needs, point to great human indifference to the regenerative capacity of ecological services which are categorized as provisioning services, support services, regulation services and amenity services. With human activities jeopardizing Gaia 'a self-regulatory mechanism, the question remains how long can we remain blind to the capability of Gaia to support us. According to living planet report (2010), our unconcern about the Gaia has exerted several great direct pressures on the biodiversity and ecosystem services. The manifold problems are likely to be manifest in the form of

- a. Habitat loss, alteration and fragmentation through conversion of land for agriculture, aquaculture, industrial or urban use.
- b. Depleted stock of biodiversity through over exploitation. Between 1990 to 2016, the world lost 502,000 square miles of (1.3 million square km) forest, according to the world bank- an area larger than South Africa [7].
- c. over exploitation of wild species: harvesting of animals and plants for food material and medicine.
- d. pollution from excessive use of chemical fertilizer and pesticides, mining waste, urban and industrial effluents etc.
- e. crop loss due to invasive species which become competitors, predators or parasites of native species, through the chain of globalization.
- f. climate change due to burning of fossil fuel, rampant deforestation as well proliferation of industries and transport.
- g. Ground water extraction at the rate of 982km³/year [8].

Biodiversity has declined by nearly 30 per cent between 1970 and 2007, with business-as-usual practices by 2050, 2.8 planets will be needed to provide for consumption and to store carbon generated from combustion of fossil fuels, land use change and chemical processes, humanity's footprint had been about 2.7gha per person while biocapacity only 1.8gha per person with resulting ecological overshoot by about 50%. Current projections indicating a CO₂ concentration ([CO₂]) between 600 and 1000ppm by the year 2100 will change the biology of invasive agricultural diseases, insects and weeds.

We cannot continue to live in this state of affairs for long since due to the growing loss of the biodiversity, the ecosystem is likely to be stressed and cause threat to the existence of mankind itself. Several institutions like OECD, IUCN, WWF have drawn attention to the increasing cost of biodiversity loss and ecosystem degradation. We are already late in responding to the call of the hour in terms

decoupling development from technology use. Sound efforts emboldened by stringent institutional measures should be afoot in terms of preserving the near extinct species, re-plantation activity with checked deforestation, replacing fossil fuel by renewable sources of energy, extension of organic farming, taking care of waste assimilative capacity of earth etc. While technology can restore some of the ecosystem services, the general decay of such services cannot be avoided. Hence it becomes utmost important that we realize our organic interaction with the ecosystem and can hardly afford to remain blind to the harm caused to Gaia. We need to be proactive at this very moment in order to safeguard future human security, health, wealth and wellbeing.

What are in Disbalance as Per Gaia?

The main problem is that the disbalance in the self-perpetuating mechanism of the Gaia has caused the problems truly global in nature. We are entrapped in a sort of vicious cycle of feedback with negative impact of the natural courses of events spreading like wildfire to different corners of the globe. As per Lovelock J [9], "we are dangerously ignorant of our own ignorance". Some of the possible causes of such disbalance can be traced to the explosive rise in population, rapid spread of global culture of consumerism, market failure in case of many kinds of natural resources, improper allocation of property right, ignored responsibility of the govt to protect the public interest etc. The adverse consequences are manifest in the form of release of massive amount of CO₂ and other GHGs in the atmosphere in just last 100 years, unbridled deforestation and plundering of wild and marine ecosystems, devouring of smaller animals for filling the stomach and consequent adverse impact on the biodiversity, rising urbanization and transboundary pollution which have reached the brink of threatening the integrity and resilience of the ecosystem to a point of almost no return.

The rapid economic development and unprecedented population growth have fueled increasing human intervention with natural resources, for food and drink, energy, transport, electronic products, living space and space for dispose of waste products [10]. The recent past incidents point to the likelihood that the origin of the virus lies in intense human-nature (sourced from animal) interactive chain and sourced in China. And as per reports from different sources, it is going to stay on earth for a long time and even might stay for good like the HIV (Human Immunodeficiency Virus). As per the essence of comments of Stephan Harding SP et al. [11], human society getting used to living in a Gaia insensitive world, tended to forget that biodiversity provides three key benefits integrity, stability and beauty. Thus humans have long remained blind to the direct untoward impact of onslaught on biodiversity or indirect impact on the Gaian process through changes in climate and bio-geo-chemical cycles.

Rarely do we measure the ecological cost or footprint inherent in unchecked interaction with the natural system. We often tend to forget that the earth does not belong to human beings, rather humans belong to the earth. The Ecological Footprint represents

the human demand on the planet's ability to provide renewable resources and ecological services. The per capita Ecological Footprint of high-income countries far exceeds that of low- and middle-income countries. During the period 1961-2012, the average per capita Ecological Footprint in high-income countries increased from 5gha to 6.2gha, with a peak of 6.6gha in 1985, it increased from 1.4 to 2.3gha per capita in middle-income countries while remained more or less steady (at approximately 1gha per capita) in low-income countries.

High-income countries experienced growth in the carbon share of the Ecological Footprint, while that of biomass-based share (i.e., the sum of cropland, grazing land, forest and fishing ground Footprints) declined. The same pattern was visible for middle-income countries. However in low-income countries, biomass-based components still represented the main Footprint share in 2012 although the underlying factors changed over time. Many of the developing low/medium income countries are experiencing rapid population. They are facing the dilemma about combating unsustainable consumption and production patterns in the face of expanding population and limited biocapacity.

What Does Gaia Want from Us ?

In order to protect Gaia from overburdened human activities, it is important to ensure that natural cycle do not go out of balance and there be sustained flow of ecological functions and eco-system services. Obtaining materials for human survival in the form of food, water, energy, shelter etc depend on a symbiotic relation of humans with nature. Ensuring the flow of these diverse ecosystem services requires continued investment in natural capital resources such that life can be sustained overtime. Concern about Gaia wants rising allocation of fund towards investment in afforestation and carbon sequestration, extension of organic farming, innovations in commercial use of renewable energy, making investment in veranda /jatropa farming as source of biofuels, maintenance of biodiversity, ecofriendly transport system, eliminating plastic pollution from ocean etc.

The single significant landmark developments that marked 2016 in India was the massive investment in forest regeneration and management programme for boosting forest governance in the country. Parliament passed the Compensatory Afforestation Fund (CAF) Act, 2016, which will unlock Rs 42,000 crore for afforestation programmes.

Failing to protect biodiversity leads to the loss of natural services, such as those provided by healthy habitats or mangroves. These are worth US\$140 billion a year. In contrast, developing a global network of nature reserves on land and at sea would require investment cost about US\$45 billion a year to maintain. Unless the loss in biodiversity can be halted there is likely to be annual losses in ecosystem services worth US\$14 trillion per year by 2050, equivalent to seven per cent of global GDP. (Rashid Sumaila, 2018) Investment in renewable energy capacity worldwide was \$282.2 billion last year, up 1% from 2018's \$280.2 billion, Clean Energy

Investment is set to hit \$2.6 Trillion this Decade. Renewables such as wind, solar and hydro-electric plants will draw about \$322 billion a year through 2025, according to separate forecasts from the International Energy Agency (Bloomberg NEF, 2019).

The annual costs of land degradation at the global level appears to be around 300 billion USD. Sub-Saharan Africa (SSA) accounts for the largest share (22%) of the total global cost of land degradation. The benefits from investments into sustainable land management were found to exceed their costs by at least two times over a 30-year planning horizon globally. In many case study countries and sub-regions, the returns from each dollar of investments into land rehabilitation were found to reach up to 5 dollars over the same period [12].

Together with investment, depreciation of natural capital resources need also be taken account of. Recent stress on the concept of genuine investment as indicated by Partha D [13] takes care of the importance of investment in natural capital and its depreciation expenses. This is defined as actual investment composed of physical, natural and human capital minus the depreciation/depletion on all such assets. If we merrily cut down the trees, deplete the biodiversity, pollute the environment without caring for setting aside some depreciation changes for such assets, then the natural assets would one day disappear from this planet. So investment in natural capital can ensure its enhancement together with accounting for its depreciation.

Importance of Health Factor for Sustainable Development

Apart from physical capital investment, sustained well-being of the humanity requires positive investment not only in the natural capital but also in human capital. Life in earth is always evolving with continuous interaction with diverse form of natural capital. So it is imperative that the pollution/degradation of natural capital is eliminated, which is likely to lead to betterment of health outcome. Further investment in health sphere itself can doubly strengthen enhanced impact on health related issues. Degraded natural capital in the form of unsafe water and insanitary condition, household (indoor) air pollution from solid fuels, ambient (outdoor) particulate matter, and ozone pollution generate health related evils. Further exposure to diverse chemical pollutants, noise and extreme temperature hazards, can aggravate the disease burdens. With arrangement of sufficient safe drinking water to the entire population, it is surmised that global diarrheal diseases would reduce by 34%. Massive interventions in reversing this type of environmental degradation together with creation of health infrastructure and enhanced flux of health personnel would pave the way for pushing Gaia towards sustainability.

Could Not this Pervasive World- Wide Death Be to Some Extent Avoided?

Although its (COVID) nature may be different this is not the only pandemic the world has suffered from. History tells us that more or less every 100 years the world has witnessed major

pandemic, for instance the Spanish flu problem during 1918-20, cholera pandemic during 1817-1824, great plague of Marseille, France during 1720-23. And during this type of crisis not only people suffer but also Govts at the helm of affairs also suffer from baffled measures to tackle it. The lessons of history were majorly unlearnt by most Govts. During Spanish flu there was more than 50m death worldwide and in case of Britain (225,000 deaths), the United States (675,000 deaths) while in India it is estimated about 18.5m. Judging by the relatively low world population figure at that time, these figures really look enormous, leaving the govts. hapless in concerned countries. However, despite this, Govt. action has not revealed the needed alertness and infrastructural preparedness to cope with similar viral outbreak. Seven cholera pandemics have afflicted the world in the past 200 years, with the first originating in India in 1817. Furthermore, there have been detected many cholera outbreaks, such as a 1991-1994 outbreak in South America and, more lately, the 2016-20 upsurge in Yemen. Usually, cholera is the upshot of inadequate investment in basic water and sanitation infrastructure, ill maintenance and health governance. Although important, these often tended to be sidelined in govt. reckonings.

Those in Charge of the Nation Hardly Take Sincere Care About People

Majority of the rich/populous countries have so long allocated a huge chunk of budget for defense and military expenses. For instance, in India defense allocation in 2020-21 budget has been 471378cr. Allocation to health sector and family welfare (Rs. 67112cr.), housing and urban affairs (RS 56040cr), funding for power and renewable energy sources (Rs 22000cr), rural development (Rs 22398cr), human resource development (Rs 99312cr) agriculture and farmers' welfare (Rs 142762) [14] have stayed severely relegated backside. The so-called rich nations have been engrossed in churning money through weapon business, flaring warfare across the globe and squandering money on defense like a spendthrift.

For instance, in 2019, USA defense budget:752b\$ which stands as 15% of federal spending; China defense budget: 261b\$ which is 5.4% of govt budget; India defense budget: 42.7b\$ which is 15.5% of govt spending; Russia defense budget: 65.1b\$ which is about 20.6% of total govt budget, all bear testimony to huge expenses targeted to boost up the defense sector. International weapon business also helps make huge amount of earnings (as per 2018 figures USA earned 10508m\$, Russia 6409m\$, China 1040m\$). But the human havoc wreaked by the virus has proved how fragile their health infrastructure is. Their unpreparedness to check the scale of death, mitigate the pace of spread of infection and inability to accommodate the Covid patients in a sanitary condition have left bare the weakness of the health edifice of most of the so called big nations [15].

The condition of countries like India/China is hanging in balance and they are shaking from fear of community outbreak at any time. Today the Govt is trembling about how to tackle if sudden massive outburst occurs in shantees /bustees where people huddle

for living.

What should have been delivered yesterday?

The issue of making shelter for dignified living (also usable for self-quarantine) and distributing them among the bustee dwellers, has not been adequately taken care of in the past. The social distancing problem could thus have been partially addressed to.

Further no adequate care has been taken to expand the facility of health insurance to informal sector workers through awareness campaign, removing institutional rigidities within health care system and removing user fees. Govt allocation to substantially cross subsidize this sector has been left largely ignored in many nations.

Instead, most of the nation states have been busy in enjoying rapid growth through commercially profitable investments in defense, natural resource extraction and flourishing consumer goods industries. The social responsibility norm need to be strengthened on the part of Govts as well like that of CSR. This is needed for undertaking major investment in public health as well as clean-up operation of environment without which viral spread cannot be tackled.

What Might Occur to Post-COVID World Environmental Condition?

While macro-economic goals of long term development can for some time in future be treated as secondary or tertiary, social goals of provision of food, health, housing and security should be recognized as primary. This might generate hope of a long term improvement in air/water quality. But if focus is made into the depth of the scenario, the environmental condition may not be as much optimistic in the post-COVID situation as it stands now.

Here are a few possible reasons

A. Usual construction activity together with slum area housing construction, more hospital infrastructure etc., is likely to raise demand for cement and steel which are highly polluting industry.

B. Expansion of pharmaceutical industry is likely to have toxic impact on both humans and animals.

C. Exigency in enhancing the continued flow in the supply chain of agricultural products might require massive use of chemical fertilizer and pesticides by setting aside the urgency of organic farming. This is likely to lead to enhanced emission of GHGs.

D. As the COVID would gradually tend to subside, urgency of maintaining social distancing mode during transport for some further extended time in future, more buses, taxis, or trains may have to be driven along different routes. This is very likely to enhance demand for more fossil fuel, leading to increased emission of toxic pollutants into the atmosphere.

E. Similar might be the condition in case of river transport requiring more ferry boats, small launches etc., rendering quality of water polluted again.

F. And after a certain period the economic system might be opened up to function in a growth oriented fashion to replenish the loss during lockdown period. This is again likely to place us face to face with a warming global climate. Hence although a temporary lull is being witnessed in global warming condition (through reduced emission of CO₂, CH₄, N₂O, SO₂ etc), once COVID begins to subside, there is every concern of a return to pre-COVID global warming scenario which poses the most serious threat to human and other species existence on earth. Already even in lockdown condition, Delhi sizzled 47.6 °C in May, '19 while a place called Churu in Rajasthan (India) was ablaze with 50 °C.

G. Are we ready to learn from this assault on Gaia and its reverse feedback impact upon us.

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