

Unheeding an Emergency: The Clarion Call of Climate Change

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Introduction

There are rare occasions on which the whole of humanity finds itself embroiled in any major crisis. Climate change these days has emerged as just such a formidable challenge, which is about to cause havoc if immediate, urgent mitigatory measures are not taken. Geographical, national divisions among the members of the international community act as the wedge in the path of any united, consorted action. Segregated, sectarian approaches in climate action are no less than self-defeating. But the post-Westphalian states, being overwhelmed with their political, economic and strategic considerations, have rarely found any convergence in collective action against global emergencies. The two world wars may be some exception that induced the occasion for united action by the nation-states. Since then the amorphous comity of nations has been haunted by many national, regional and global crises (like the economic depressions, the present COVID-19 pandemic) which have bogged down the decision-makers, thereby exposing their parochialism and depriving mankind of some cherished gains.

Climate change as a crisis is unique in the sense that any actor, in its micro capacity anywhere, if harms the climate, is sure to impact it and the whole of humanity is to face the consequences. 'On our planet, everything is connected to everything else. In a sense, we have a very small planet. The winds are changing currently. This is partly natural, but there is also the signature of human influence on changing winds. Now, the winds affect the oceans — and the oceans affect the glacier. If the winds are perturbed, they actually move ocean currents. So, they can move a warm ocean current to somewhere it hasn't been before. Some of that is moving towards Antarctica and causing the change,' observes David Holland, Director of New York University's Environmental Fluid Dynamics

Lab.¹ According to the World Development Report, 2010, 'The effects of climate change are already visible in higher average air and ocean temperatures, widespread melting of snow and ice, and rising sea levels. Cold days, cold nights, and forests have become less frequent while heatwaves are more common. Globally, precipitation has increased ...and many other regions have seen more frequent and more intense droughts. Heavy rainfall and floods have become more common, and the damage from and probably the intensity of storm and tropical cyclones have increased.'²

Recently, some of the exceptional climatic conditions (like the incessant rains in Kerala, India in August 2019 and the severe flooding in Venice, Italy in November 2019) compel us to see, that something is happening for the worse just because the adaptability to such disasters has been pushed to the limit, has rather proved to be precariously inadequate. Homo sapiens are highly resilient, which is evident from their rising numbers and the resultant disappearance of many other species, which have fallen prey to the greed of the former. Their activities are not limited to harming the animal kingdom, it goes against nature as a whole. Sometimes insightful observers agree on the fact that nature is always right. But mostly it is evident that nature is compelled to course correct when artifice (of man) arm-twists it.

A Microanalysis

Two consecutive devastating downpour in Kerala (India) in August 2019 and 2018 caused havoc by killing hundreds, rendering thousands homeless, maiming the state with large-scale destruction amounting to thousands of crores of rupees. The 2018 deluge was more severe, described by the state chief minister Pinarayi Vijayan as unprecedented since 1924. 'In August 2018, there was an abnormal amount of moisture build-up in air due to the south-west monsoon flow from the Arabian Sea and a low-pressure system over the Bay of Bengal. The lifting of moisture-laden air when it hits the steaming slopes

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of the Western Ghats (orographic effect) acted together to make the rains deadly over Kerala,' stated Sandeep Pattnaik of the IIT, Bhubaneswar's School of Earth, Ocean and Climate Sciences.³

Venice in Italy experienced the worst floods in 50 years, attributable to climate change. With climate change and sea levels rising globally, Venice, originally founded on soft, boggy ground, finds itself in increasingly more trouble each year. Levels in the Mediterranean Sea basin could rise as much as five feet by the end of this century raising the risk that the subsiding city could be flooded more often than the current average of four times a year, as experts believe.⁴ On the Venice floods, Nikky Berry (a BBC meteorologist) says, 'The recent flooding in Venice was caused by a combination of high spring tides and a meteorological storm surge driven by strong sirocco winds blowing north-eastwards across the Adriatic Sea. When these two events coincide, we get what is known as *Acqua Alta* (high water). The recent *Acqua Alta* occurrence in Venice is the second highest tide in recorded history. However, if we look at the top 10 tides, five have occurred in the past 20 years and the most recent was only last year.'⁵ It is observed that climate change has exacerbated the frequency and severity of natural disasters like massive forest fires, droughts, hurricanes, floods. During 2018, more than 39 million people have been affected in such disasters.⁶

The Warning Signs

Climate change, the consequence of global warming, is going to adversely affect the whole of humanity in varying degrees. According to the World Development Report, 2010, 'Climate change threatens all countries, with developing countries the most vulnerable. Estimates are that they would bear some 75 to 80 percent of the costs of damages caused by the changing climate. Even a 2° warming above preindustrial temperatures — the minimum the world is likely to experience — could result in permanent reductions in GDP of 4 to 5 percent for Africa, and South Asia. Most developing countries lack sufficient financial and technical capacities to manage increasing climate risk. They also depend more directly on climate sensitive natural resources for income and wellbeing. And most are in tropical and subtropical regions already subject to highly variable climate.'⁷

Global warming is attributed to the concentration of greenhouse gases (GHGs) in the atmosphere. Carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and ozone (O₃) are the greenhouse gases present in the atmosphere, responsible for trapping the heat. 'They warm Earth's surface by impeding the escape of infrared (heat) energy into space. The warming effect created by the natural

levels of these gases is the natural greenhouse effect. This effect warms the world about 33° more than it would be otherwise, keeps most of the world's water in the liquid phase, and allows life to exist from the equator to near the poles.'⁸

The world is turning dangerously warmer because of irresponsible human activities that have added to the concentration of such gases in the atmosphere. Activities like increasing industrialisation, burning of fossil fuels like coal, oil, and natural gas have significantly increased the concentration of gases like CO₂. Land-use changes and deforestation also have contributed to the increased emission of such gases. The Intergovernmental Panel on Climate Change (IPCC) describes such human activities as 'dangerous anthropogenic interference' that has made the warming of the climate system unequivocal.

What If?

Given the present pattern of lifestyle and the growing population, to keep the rising atmospheric temperature under check seems a remote possibility. If the rising trend continues unabated, catastrophic consequences are predicted. Experts speculate the rise of atmospheric temperature may vary between 2° to 5° or even in worst case scenario it may touch 7° compared to the preindustrial level. According to some study, if temperatures rise to 5° above preindustrial levels, 'about 3 billion additional people would suffer water stress, corals would have mostly died off, some 50 percent of species worldwide would eventually go extinct, productivity of crops in both temperate and tropical zones would fall, about 30 percent of coastal wetlands would be inundated, the world would be committed to several meters of sea-level rise, and there would be substantial burden on health systems from increasing malnutrition and diarrheal and cardiorespiratory diseases.'⁹

The danger due to climate change is not in the future tense only: the present is also replete with tell-tale signs of impending danger. As for example, the Antarctic or the polar regions have now been at the centre of many climate studies. Michelle LaRue who teaches Antarctic Marine Science at the University of Canterbury, New Zealand states that 'Our polar regions are effectively Earth's refrigerators — they modulate our climate around the world and keep it relatively stable. By disrupting Earth's cooling system, we are likely to see further catastrophic weather events, like hurricanes, storms, fires, droughts and flooding. Furthermore, the oceans take up a substantial proportion of CO₂, but there is a limit to that ability and then the oceans start to become slightly acidic. When that happens, the calciferous or made of calcium organisms that make up our primary production

in the oceans become less likely to survive and provide resources for the rest of the food chain."¹⁰

LaRue's forecast is potent to draw attention of anyone who has anomalous understanding of the eternal interdependence between the environment and the species sustained by it. The remarkable change, according to her, is visible at the Thwaites glacier. The glacier is retreating and becoming lower and lower every passing year. During the course of research, drilling in the glacier found warm waters beneath and that is driving the change, as LaRue reveals. 'If you live in, say, New York, Florida or Bangladesh, it is increasingly likely that these places could go underwater if steps are not taken. It could be decades to centuries, but the timeline is unravelling now. This is an extreme event but unlike, say, hurricanes where we have experience of what happens, this is a once only event. It will be like having a typhoon, but one we have never seen before. The Thwaites has lost about 600 billion tons of ice over several decades. Scientists estimate the rate of ice loss has accelerated to about 50 billion tons per annum in the recent years.'

Some Antarctic Facts

Lewis Pugh (popularly known as UN patron of oceans and environmental diplomat) states some important facts about Antarctica. The coldest continent on earth has ice sheet of about 3 miles thick which contains about 90 percent of the world's freshwater. Between 2014-17, it has lost the amount of ice as the Arctic lost in last 30 years. As an unusual development, Antarctica recorded the hottest temperature (so far) on 6 February 2020, equal to the temperature recorded in Los Angeles at the same time. Pugh feels that the record high temperature could be linked to 'foehn,' a warming of air coming down a slope. Warmer winds and warm ocean currents, as many scientists believe, are causing significant ice melt across the Antarctic. According to their estimate, summer sea ice in the region could disappear within 20-25 years. Antarctica is now losing six times more ice than it did in the 1980s. The cold water in the region works as a massive carbon sink, taking CO₂ down into the depths and storing it.¹¹

But the positive effect of the Antarctic may be gone sooner than later given the reckless human lifestyle that is causing massive damages to the environment. 'As carbon emissions the world over rise, such heating intensifies, causing the melting of the Antarctic's ice. Between 1992 and 2017, the rate of ice loss from the Antarctic peninsula has reportedly quintupled. The possible dangers are extreme — as Antarctica melts, ocean levels will gradually rise, some studies positing, by even 10 feet. Such changes will cause more extreme weather events, while rising

oceans could flood multiple coastal areas. Losing valuable resources like land, crops, infrastructure, the disruptions to life will be at an unimaginable scale.'¹²

Global Wealth Gap and Climate Change

Inequality among nations, which has to some extent declined after the introduction of LPG (liberalisation, privatisation, globalisation) would have declined faster had climate change not been an impacting factor. This finding is based on the research of Marshall Burke (Stanford economist) and Noah Diffenbaugh (a climate scientist at Stanford). According to them, when temperatures were hotter than average, economic growth slowed in poor countries but accelerated in the rich. That is because the world's richest countries are by and large in the cooler latitudes, while the poor countries are disproportionately concentrated around the equator. A slight temperature increase in such places can have a devastating impact on crop production, labour productivity, and human health.¹³

As has been found in many studies, global temperatures have risen by nearly 1^o or 1.8^o since the start of the industrial age and the two researchers were interested in calculating what effect that increase has had on national economies and the global wealth gap. Interestingly, the duo concluded that the poor countries lost out while the rich countries, especially those who have racked up a lot of emissions over the last 50 years, have 'benefited from global warming.' According to their estimate, the gap in per capita income in the richest and the poorest countries is 25 percentage points larger than it would have been without climate change.¹⁴

According to the study, between 1961 and 2000, climate change dampened per capita incomes in the world's poorest countries by between 17 per cent and 30 per cent. The hardest hit among the countries were some of the largest. Interestingly, India would have been 30 per cent richer without climate change, according to the study. By the same logic, Nigeria became 29 per cent poorer whereas Norway became 34 per cent richer. 'If you're a really cool country, you have been helped a lot. If you are a really warm country, you've been hurt a lot. And if you're in the middle the effects have been smaller or much more muted,' said Burke.¹⁵

Who Will Lend Voice to the Voiceless?

Climate change is not discriminatory in its impact, though the species (humans) largely responsible for inducing it, possess the ability to assess its impact and have been exclusively concerned for their survival, ignoring the others without whose complementary contribution/

presence the environment would be sustainable at all. There are millions of species, visible or invisible, which have exclusive role and contribution, due to which the unique nature of the earth's environment is an acknowledged fact. But climate change has turned out to be the nemesis of some varieties of them. 'Up to one million species face extinction due to human influence, according to a draft UN report that catalogues how humanity has undermined the natural resources upon which its very survival depends. The accelerating loss of clean air, drinkable water, CO₂-absorbing forests, pollinating insects, protein-rich fish, and storm-blocking mangroves — to name but a few of the dwindling services rendered by Nature — poses no less a threat than climate change.'¹⁶

Researches on the Antarctic suggest that 'ice obligate species, which are animals that require ice to survive, are not going to do well with climate change. For example, emperor penguins need sea ice that is fastened to the Antarctic coastline as a platform to breed, raise their chicks and as safe zones from predators like leopard seals and killer whales. As ocean and air temperatures continue to rise, the extent and duration of ice around the continent is likely to decrease — which means that emperor penguins are likely to decrease in number as well.'¹⁷ Penguins, whales, and dolphins don't have a seat in the House of Commons, the US congress or the Indian parliament. Somebody needs to speak on their behalf,' pleads Lewis Pugh.¹⁸

Ignorance is Curse

The inverse relationship between forest cover and global warming is beyond doubt. If a (teenage adolescent) girl (Greta Thunberg) could feel the gravity of climate change, the 'green villains' and some grownups around the world — destroying and looting vast stretches of forests for short-term, selfish gains — is indicative of any sense of shame vanishing. The culprits and criminals — some forest department employees together with some men who matter in the government — have woven an obnoxious nexus to jeopardize all living organisms and destroy the environment: the metaphorical Kalidas busy in the suicidal axing of the branch on which he is seated. The Living Planet Report 2020 reveals that there is a 68 per cent average decline of birds, amphibians, mammals, fish and reptiles since 1970.¹⁹

No coercion, cajoling, nothing can persuade these debauches to desist from their destructive acts. These 'burdens on mother earth' have come with only one purpose in life — to gratify the self by hook or by crook. The global pandemic of COVID-19 has pulverized the whole world and mankind is still clueless as to how to get rid of it. Persistent efforts and campaigns are being

made day in and day out to spread awareness among people so that they refrain from activities that could aggravate the pandemic. Out on any Indian street, one (a sensible human being) will be surprised to notice 'spitting cobras,' shut-down and lock-down violators, and mask-less morons roaming with careless abandon and their numbers multiplying more potentially than the virus they are abetting to spread. No system can bring them to book except, perhaps, violent repression.

Sources claim that deforestation in India during the last decades has led to degradation of over 30 per cent of its land and loss of 1.6 million hectares of its forest cover.²⁰ This is in contrast to the ambitious claims made in the biennial India State of Forest Report (ISFR). The report claims an increase in the country's forest and tree cover to 80.73 million hectare or 24.56 per cent of its total area. The International Union for Conservation of Nature (IUCN) and the Ministry of Environment, Forests and Climate Change (MoEFCC) in their 2019 progress report on forest restoration state that 9.8 million hectares of deforested and degraded land have been brought under restoration since 2011.

But in the article it is claimed that a closer look at ISFR numbers reveals a disappointing growth of just 0.13 per cent in India's green cover. Claims and counter-claims are a disappointing recurrence in India. But what is unignorable (in India) is that deforestation and land degradation do impact agricultural productivity, water quality and biodiversity, thereby affecting over 600 million people in India. There is no denying the fact that more than a fifth of the country's population, according to the writer, depends on forests for subsistence. She cites a Tata Energy Research Institute (TERI) study, according to which forest degradation is depriving the country of 1.4 per cent of its GDP annually.

Senseless deforestation in India has directly and severely affected the forest-dwelling communities, being treated as encroachers of forest lands which they were cultivating for generations. The so-called developmental measures like mining, industrialisation, agriculture (irrigation) have significantly increased the carbon footprint of the country as a whole. However, some sources accused the forest dwellers to have been instrumental in increasing their and the country's carbon footprint. Luckily, some deviation from the traditional way of thinking are unravelling some positive changes.

Manisha Verma, Principal Secretary in the Tribal Development Department of the Maharashtra government claims that the carbon footprints of an average tribal household are negligible in comparison with the rich urban households.²¹ She is optimistic that the Forest Right Act (FRA) if implemented sincerely, can be a fruitful step in the direction of forest conservation and tribal welfare. The Preamble to the FRA states that it aims to 'undo the

historical injustice' to forest-dwelling communities who were cultivating their land for generations but were treated as encroachers, as their rights were not recorded. The legislation recognises, vests, and provides for recording of rights of forest dwellers for self-cultivation up to four hectares, enabling security of tenure and livelihood to vulnerable communities. What is encouraging is that the act confers on the communities, the right to protect, regenerate and manage forest resources and provides for safeguards against arbitrary displacement. Forests have been preserved best where tribal communities reside, Verma concludes.

Misplaced Bias?

Attribution of responsibility for contributing to climate change has brought to the fore a novel idea: that the poor are more responsible for inducing the crisis than the rich. Such a finding has been made by a research institution in the U.S.A., as Sunita Narain mentions. The research institution inferred that the poor contributed substantially to global warming as two of their activities, rice cultivation and livestock rearing were both unsustainable activities.²² But Narain is sceptical of such an accusation and insists on the fact that the world should differentiate between 'luxury emissions' from vehicles owned by the rich and 'survival emissions' from subsistence paddy cultivation and animal rearing by the poor.

Describing climate change as 'the biggest existential crisis that the planet has ever faced,' Narain differentiates that industrialised countries have to some extent succeeded in delinking the SO₂ emissions from economic growth but not so with CO₂ emissions. 'Per capita CO₂ emissions remain closely related to a country's level of economic development, and thus standard of living. It is evident that as long as the world economy is carbon-based-driven by energy from coal, oil, and natural gas, growth cannot be delinked substantially from CO₂ emissions,' according to Narain. She further states that, 'The only way to avert climate change is to reduce emissions dramatically. But things are never quite this simple. The use of fossil fuels (the major reason for CO₂ emission) is closely linked to economic growth and lifestyle. Every human being contributes to the CO₂ concentrations in the atmosphere. However, the person's lifestyle decides the amount that is emitted. The more prosperous a country's economy is, higher is its fossil fuel consumption, resulting in higher greenhouse gas emissions.'

A Silver Lining in the Cloud

Two former alumni of IIT, Kharagpur, Aniruddha Sharma and Prateek Bumb, have founded a company — Carbon Clean Solutions — which is based on a crucial technology

the world needs, to reach the low carbon-emissions targets set out in the Paris climate agreement.²³ The technology in use since a long time, focuses on carbon capture and storage (CCS) where carbon emissions from plants are collected and injected deep underground at great cost. In recent years, the focus has shifted in part to carbon capture and utilisation (CCU), where the emissions are turned into useful products.

Carbon Clean Solutions by the duo captures CO₂ from its coal-fired boiler and converts it into soda ash (a chemical cousin of the baking soda) in its Tuticorin plant. Sharma claims it to be a world's first commercial-scale plant set to capture 60,000 tons of CO₂ annually, which does it so cheaply that it did not need any government subsidies. This may prove to be a major breakthrough as the UN and the IPCC (Inter-governmental Panel on Climate Change) emphasize on the need of a technology that can be helpful in burning of fossil fuels without releasing all of the CO₂ produced. The harnessing of renewable sources though is on the rise, it is not yet adequate to keep the global temperature from rising above 2°C in comparison with the pre-industrial average and if it so continues it may not be too late when climate change reaches a critical point of no return.

Conclusion

The signing of the Paris agreement on climate change by 171 countries, including India, on the Earth Day (22 April, 2016) is a major development. This marks the culmination of two decades of efforts by the international community to bring together so many nations and get them to commit to a global agreement 'to save the one resource that we all share and the one planet that sustains us all.'²⁴ It is encouraging to note that the agreement is a record of sorts which brought together so many countries for the first time and many countries signed the agreement on the first day itself. It is also to the credit of international diplomacy that such a big event could be a possibility.

There are miles to go. The agreement is yet to be ratified by the U.S., China, E.U., India though, understandably, a handful of island nations have already done so. However, the Kyoto Protocol took four years to be ratified after finalisation. As a conditionality, it is only when at least 55 nations, representing 55 per cent of the global emissions, ratify the Paris agreement, that it will come into force. The UNFCCC (United Nations Framework Convention on Climate Change) lists 135 different tasks that have to be completed by every signatory before the deal can be operationalised.²⁵ India, as a leading nation, has made the fight against climate change a priority item in its foreign policy and global governance agenda. Hopefully, other major states rise to the occasion earlier than expected as

there is still a long way to go before the full potential of the Paris agreement can be realised.

The climate conferences in the past have been in the nature of one step forward, two steps backward. The inherent intractable issues — selfish interest among nation-states — have been the nemesis of the series of conferences so far. Whether the Glasgow (Scotland, UK) UN Climate Change Conference (1-12 November 2021) will be a game-changer or will end up in a whimper, is only a matter of time to be assessed in terms of output. A serious revisit, of the 'net-zero' emissions pledge by over 120 countries to be met by mid-century, is imperative before or during the Glasgow conference. 'Net zero or carbon neutrality means that the amount of CO₂ produced by a country is balanced by the amount removed from the atmosphere. According to IPCC, to limit the global temperature increase to 1.5°C, global net CO₂ emissions should decline by about 45 per cent by 2030, reaching net zero around 2050,' explains Chandra Bhushan, CEO, iFOREST (Chief Executive Officer, International Forum for Environment, Sustainability and Technology).²⁶

It is quite heartening to note that India is right on track in its goal of achieving the 'net zero' emissions. '... India is doing all the things it needs to do to get us there (to net-zero). India has a plan right now for 450 GW. If 450 GW of renewable power is put into place, India would be one of the few nations helping to keep 1.5 degrees alive,' concurs John Kerry, US special envoy who was recently on a special climate diplomacy mission to India.²⁷ Micro-level response to an impending climate emergency is just like a drop in the ocean. If pledges by the 120 odd countries actually fructify, there may be some ray of hope in making the earth/environment sustainable. Else, doomsday is not too far if the extreme climatic conditions are any indication. Marco Lambertini, DG, WWF International makes a pertinent observation: 'It is time we answer Nature's SOS. Not just to secure the amazing biodiversity of life we love and have the moral duty to coexist with, but because ignoring it puts the future of nearly 8 billion people at stake.'²⁸

Notes

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