

TACKLING CLIMATE CHANGE

Science and Capitalist Politics

Socialist Unity Centre of India (Communist)

TACKLING CLIMATE CHANGE : Science and Capitalist Politics

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Publisher's Note

Problem of Global Warming and climate change has assumed alarming proportion posing serious threat to mankind and human civilization. This problem is not divinely ordained one but man-made, to be more exact, made by the profit-monger utterly inhuman imperialism-capitalism. An article covering the basic aspects of Global Warming, both from scientific and political points of view, together with a write-up on the recent CO29, international climate conference, held in Baku, Azerbaijan, have been compiled in this booklet. We hope the readers of this booklet shall be able to have a due understanding of the gravity of the problem as well as the course of action to prevent it.

January, 2025
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TACKLING CLIMATE CHANGE : Science and Capitalist Politics

In last few years, people all over the globe are witnessing the menacing change of climate. The UK sweltered through its hottest June when mercury hit 40.3° C in Coningsby, Lincolnshire on 19 July 2022, the highest temperature in the UK verified by the Met Office. Paris recorded 45.9° in June 2019. Delhi hit record 50.5° degrees in May 2024. Rajasthan's Churu recorded 50.5° temperature on 28 May 2024, the highest temperature of the season so far, marking "unprecedented" severe heat wave conditions prevailing in north India. Most astonishingly, Una in hilly Himachal Pradesh recorded a temperature of 44 degree. In neighbouring Bangladesh, a severe heatwave saw temperatures climb above 43°. Myanmar recorded its hottest-ever April temperature of 48.2°. The average global surface temperature breached the limit of 1.5° C rise above the pre-industrial (1850-1900) average, a limit that was mandated by the Paris Climate Summit of 2015.

The West African nations of Mali and Burkina Faso experienced an exceptional heatwave from 1 April until 5 April, with soaring temperatures above 45 degrees, triggering a large number of deaths. On the other hand, unprecedented downpour flooded the city of Dubai in predominantly desert area on 19 April last. Neighbouring Oman also witnessed

heavy rains and flooding that killed at least 20 people. Earlier we had witnessed similar devastating flooding due to incessant rains in Chennai and Mumbai. Increased precipitation in the mountainous areas gives rise to glacial lake outbursts, landslides and floods as happened in the Kedarnath disaster in Uttarakhand and Wayanad disaster in Kerala. It has come to be known that surface temperatures of all oceans are warming at a fast rate. Global mean sea surface temperature has increased by 0.60 to 1.01°C from pre-industrial times. Surface warming has increased the evaporation rate, increasing the water vapour content in the atmosphere. A warmer atmosphere can hold more moisture and dump it as extra rainfall. Extreme climatic events such as very heavy rainfall within a short duration, and cyclones have increased over Arabian Peninsula and western and eastern coastal regions of India. The Indian Meteorological Department has recorded an unusually high number of heat-wave days from April to June 2024. High humidity often adds to the heat stress. It has been estimated that the areas under heat stress have gone up by 30% to 40% in the past 70 years. Heat-waves and humid stress will become more intense and more frequent over South and Southeast Asia during the 21st century. The maximum brunt will be borne by the poor and marginalized people, the slum dwellers in the cities living in overcrowded tenements. High temperatures gave rise to devastating wildfires in Australia, Canada, southwestern United States, Spain, Portugal, Greece and many other countries. In India also the incidents of wildfires are going up because of heat-wave condition. The tribal people living in the forests are the worst victims. Thus, climate change is one of the defining issues of our time.

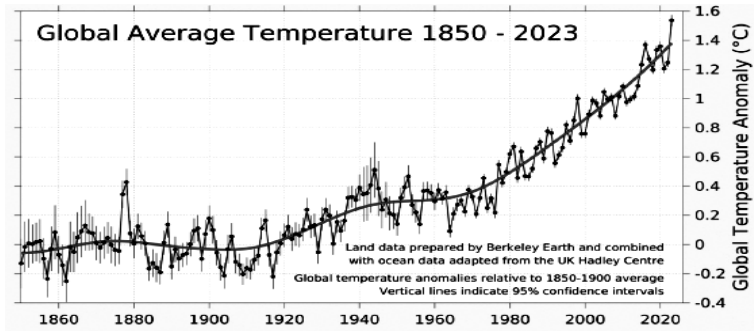
Why this severe climate change

Climate scientists have conclusively proved that rising global temperatures, caused by human-led greenhouse gases (GHGs) emission is responsible for extreme weather events

around the world, including abnormal rise in temperature, intense rainfall, frequent and more powerful cyclones and severe and lethal thunderstorms. While science is clear about the reality of climate change, some are skeptical about it, the so-called “climate-deniers”. Climate change refers to long term changes. Typically, a period of 30 years is chosen to define climate and describe its changes. Climatic conditions are driven by energetics in the atmosphere. Temperature is the most important and most commonly used parameter to characterize the atmospheric energy and thus the climate. Hence, much of the discussion on climate change is centred on temperature change in the atmosphere. The term global warming is often used interchangeably with climate change, though global warming is but one aspect, albeit the most important aspect, of climate change. What poses a problem for identifying climate change is the natural variability of weather in different time scales. There is diurnal/seasonal/annual variability. Thus, in some year summer temperatures are very high, and in another year the summer temperatures are milder. Because of this natural variability it is a daunting task to detect whether climate is changing and to elucidate its nature on a scientific basis.

Global warming

It is pertinent to have a basic idea of the science behind global warming even if it sounds a bit technical. Reliable instrumental recording of weather parameters like temperature, humidity, precipitation, etc., started from the middle of the nineteenth century. Now there are thousands of weather stations spread all around the globe automatically recording the temperature and other meteorological data 24x7 and transmitting them to a central station. Scientists subject the huge amount of data to rigorous statistical analyses to arrive at an average temperature of the globe or of a specified territory and construct a time-series to depict the variation of temperature with time (Figure 1). Analysis of the time-series

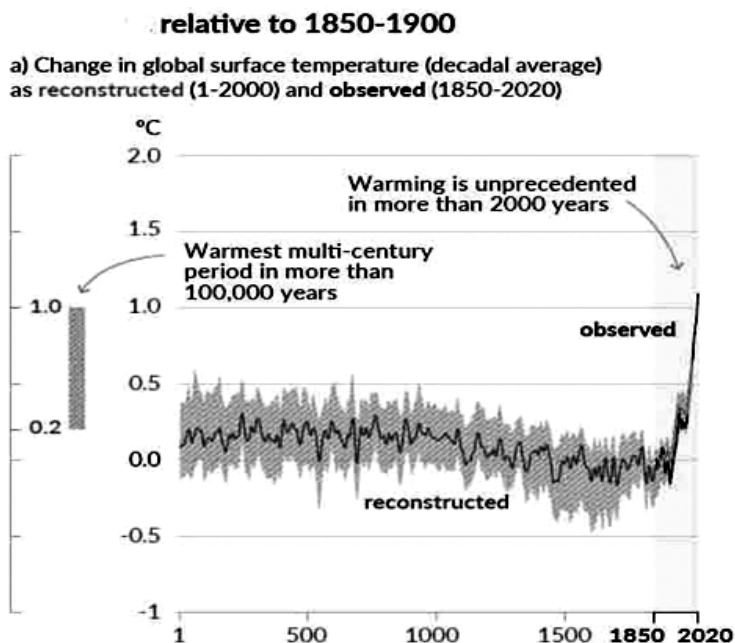
**Figure 1**

curve indicates that the average global temperature has increased by 1.3°C from 1850-1900 average to 2012-2023. It is to be noted that within this overall trend of increase, in short stretches of time, e.g. from 1876 to 1900 A.D., there has been slight decrease in temperature. On the other hand, the rate of warming since 1970 is higher than the rate before. Since 1850 every decade is warmer than the previous decade. The rate of warming over past thirty years is much faster than the average rate since the start of the 20th century. Therefore, the Earth is warming at a faster rate in the present time than before.

2024 has recorded the highest average global temperature in last 2000 years; it is about 1.55°C above the average temperature from 1850-1900, regarded as the pre-industrial baseline. Each month from June to December in 2024 was warmer than the corresponding month in any previous year. The last ten years stand out as the warmest ten years in the instrumental data record. In India, compared to 1850, the temperature has risen by 1.18°C in 2023. The warming is non-uniform across the globe. Most land areas have warmed more than most ocean areas, and the Arctic and the high latitude regions are warming more than most other regions. This has got serious implications for global climate. The measurements indicate that the reality of global warming cannot be scientifically denied.

Causes of Climate Change

The Earth has experienced many episodes of climate change in the past. Clearly, such past climate changes could not



be human-induced because human beings had not appeared then. From 0 A.D. to 1700 A.D the global average temperature varied very little, but afterwards it started to rise rapidly, as the Industrial Revolution advanced (Figure 2).

The natural climate changes took place on a geological time scale, that is, over hundreds of thousands or millions of years, while the human induced changes are taking place within 2 or 3 centuries. Human induced changes are much faster than natural changes. There is little dissent among the scientists on the view that the present phase of climate change is principally caused by emission of greenhouse gases (GHGs) comprising carbon dioxide, methane and nitrous oxide and some other

minor gases, due to human activities, primarily burning of fuels like coal, gas and oil. GHGs in the atmosphere lead to global warming because they trap the heat radiated by the Earth in the atmosphere, and with increase in the GHG concentration in the atmosphere the atmospheric and the surface temperatures rise. Among the GHGs carbon dioxide (CO_2) is the most abundant (76%) followed by methane (CH_4 , 16%) and nitrous oxide (N_2O , 6%); halocarbons and other gases are only 2%; methane has nearly 30 times more potential for global warming than CO_2 and nitrous oxide has nearly 270 times more, but these have very low concentration in the atmosphere.

CO_2 emissions come majorly from burning fossil fuels (like coal) for electricity generation and heating, for transport and for manufacturing and construction industry. The largest methane sources in India are livestock, predominantly cattle, and waste water. Other sources are coal mining, rice cultivation, biofuel combustions and landfills. Aerosols, which are suspensions of fine solid particles or liquid droplets released by the industry into the atmosphere can give rise to heating or cooling of the atmosphere, depending on their properties. Trees absorb CO_2 from the atmosphere during photosynthesis, therefore deforestation and consequent land use change lead to increase of CO_2 concentration in the atmosphere. Loss of surface reflectivity (surface albedo), like loss of ice cover, is also a factor causing global warming. And this process is further catalyzed by reckless emission of toxic gases from the factories (like what happened in Bhopal disaster, 1984, Starlite Copper plant at Thoothukudi, Tamil Nadu, in 2018) or utter neglect in disposal of industrial wastes. The large industrial houses and multinationals do this with a view to keeping cost of production down for profit maximization and the pliant governments remain as indulgent onlookers. Also disturbing ecological balance by mindless deforestation, loss of water bodies due to unplanned urbanization, wasteful tourism, and such other profit-making projects mainly undertaken by the corporate houses as well as

the bourgeois governments also constitute a major factor for climate change.

The extent of the climate crisis is revealed by the recent increase in the CO₂ level in the atmosphere. From more than 500,000 years ago to around 1800 AD it remained at about 275 ppm, and during the last three hundred years the concentration has skyrocketed to more than 420 ppm giving rise to the well known hockey stick curve (Figure 3). The curves for methane and nitrous oxide show similar jumps. This is mirrored by the sharp increase in the global mean temperature by about 1.5^o C in the post-Industrial-Revolution era. On the basis of this concurrent increase of GHG and temperature it can be asserted that global warming is a reality and that it is majorly attributable to emission of GHG concentration due to human activity.

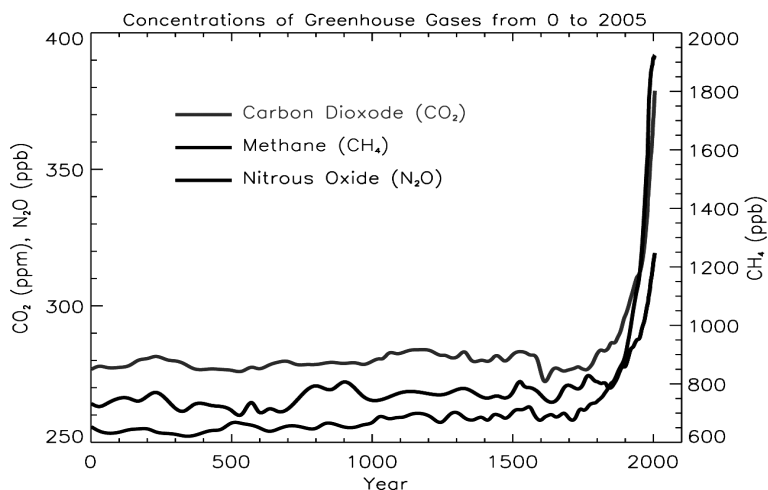


Figure 3

Why is sea level rising?

Global sea levels are rising because of two factors. (i) thermal expansion due to ocean warming, and (ii) melting of mountain glaciers and of ice sheets on Antarctica and Greenland. Global average sea level has risen by about 250 mm since 1980. Relative sea level around Asia has risen faster

than the global average. Some of the small island countries face the prospect of submergence. Many coastal areas in India, particularly the Sundarbans and parts of the eastern seacoast are extremely vulnerable to the impact of sea level rise—coastal area loss and shore-line retreat. Agriculture is adversely affected, and millions of people are facing the spectre of displacement from their home territory, and of becoming “climate refugees”.

Extreme weather events caused by climate change

Global warming also leads to storage of more energy in the atmosphere and in the oceans. As a consequence, extreme weather events like heat waves, cyclones, excessive rainfall and flooding and ecological and agricultural drought become more frequent and more intense. The European heat waves of 2003, 2006, 2015 and 2023 were associated with never before experienced temperatures and led to thousands of death.

Warmer oceans provide extra energy to tropical cyclones and make them more frequent, and more strong. The Bay of Bengal is notorious as the birthplace of many cyclones. In recent years the frequency of severe cyclones have increased and they have become more intense and more destructive, e.g., Odisha Super-cyclone in 1999, Cyclone Nargis in 2008, Cyclone Aila in 2009, Cyclone Fani in 2019, Cyclone Amphan in 2020.

High atmospheric CO₂ associated with global warming would lead to ocean acidification. Models also predict that warming would lead to oxygen depletion in large parts of the ocean. Methane hydrates on the floor of deep oceans could be destabilized by temperature rise and release methane to the atmosphere which would lead to further warming (feedback effect). Changes in temperature and resultant changes in chemistry of the oceans would have devastating effect on marine life, ocean circulation and global climatic pattern.

Warm air holds more moisture leading to intense rainfall

events. Several localities spread all over the globe, like Dubai, Mumbai, Kerala, Delhi, Chennai have witnessed excessive rainfall spread over a few days which cause extensive damage to homes and infrastructures and massive loss of life. Global warming is also leading to prolonged droughts in some areas, resulting in water scarcity, and affecting agriculture and water supply. Such extreme weather events devastate crops and livestock leading to food shortages. The marginal farmers face ruination from such drought and flood events.

Climate change adversely affects human health. Heat-waves increase the risk of heat related illnesses, heat strokes and deaths. Floods cause spread of water-borne diseases, while prolonged droughts may cause malnutrition and promote the spread of vector-borne diseases like malaria and dengue. Thus climate change adversely affects public health.

Climate change has profound impact on the biosphere. This includes earlier timing of spring events like leaf-unfolding, bird migration and egg-laying; and pole-ward and topographically upward shifts in ranges in plant and animal species. Climate change promotes loss of biodiversity through extinction of many species, and concurrently adaptive mutation and creation of new species. Some have warned that we are facing a mass extinction event.

Scientists have warned about the possibility of abrupt climate change, in which gradual global warming triggers a sudden shift in the earth's climate, causing parts of the world to dramatically heat up or cool down in the span of a few years. Climate change impacts the economy also because it affects resource mobilization and productivity. A recent study in India has shown that *“one degree Celsius temperature rise has depressed economic growth by about 3.89% with substantial variations across states.”*

What does the future have in store?

The Earth is set on a course of global warming and

consequent climate change. The scientific evidence also suggests that the present phase of warming started with the Industrial Revolution. Since then human activity has put more and more greenhouse gases in the atmosphere. What will happen in future will depend on what economic strategies we adopt and what aggressive actions we take up to reduce GHG emission. The Intergovernmental Panel on Climate Change (IPCC) has listed a number possible future scenarios for socio-economic development and the emission pathway in each (Figure 4). The emission characteristics and the future warming in the different scenarios till 2100 A.D. are given in the adjoining Table.

Scenario	GHG Emission Features	Estimated warming 2041-2060	Estimated warming 2100	Estimated average Sea Level Rise
SSP1-1.9	Very low emission Net zero around 2050	1.6 ^o C	1.4 ^o C	0.38 m
SSP1-2.6	Low emission Net zero around 2075	1.7 ^o C	1.8 ^o C	0.44 m
SSP2-4.5	Intermediate emission Current level till 2050, thenfall, net zero not attained	2.0 ^o C)	2.7 ^o C	0.56 m
SSP3-7.0	High emission Double by 2100	2.1 ^o C	3.6 ^o C	0.68 m
SSP5-8.5	Very high emission Triple by 2075	2.4 ^o C	4.4 ^o C	0.77 m

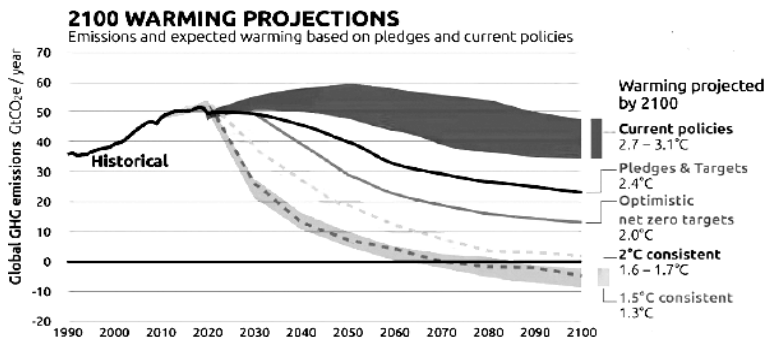


Figure 4

Future warming for different emission scenarios

Thus, if we do not take any corrective steps the temperature is due to rise by over 4°C by 2100, putting the survival of civilization and human society at stake. Scientists aver that 1.5°C to 2.0°C rise of global mean temperature is the maximum acceptable limit. Beyond 1.5°C rise the climate would become unstable, there would be more frequent extreme weather events, like severe drought, intense heat waves, devastating wildfires, powerful cyclones, bleaching of corals, disappearance of Arctic sea ice, ecosystem disruption, disastrous sea-level rise, disruptions in food production and crop failure and habitat destruction. If we want to keep the warming to the level of 1.5°C to 2.0°C, the current GHG emission must be reduced by 45 per cent by 2030 relative to the 2010 level, and the 'net zero' emission, that is when the GHG added to the atmosphere and the GHG removed from it become the same, must be attained by 2050. It is to be noted that CO₂ stays in the atmosphere for many years and even if the emission stops instantaneously just now the temperature would still continue to rise before it comes down.

What can we do to tackle climate change?

Scientific research has established that there is a direct relation between the global average temperature and the concentration of GHG in the atmosphere. Thus, for 1.5°C rise in temperature from the pre-industrial value, the median value of CO₂ would be 507 ppm and for 2°C rise it would be 618 ppm. This is the total carbon budget. The average 2023 concentration of 420 ppm is close to these values. The difference defines the remaining carbon budget. To keep the climate change in check the target should be to adopt an emission pathway that would keep the CO₂ within the remaining budget, if the temperature rise is to be kept below the threshold value of 1.5°-2° C.

Mitigation and Adaptation are the twin strategies to face the consequences of climate change. As there is a direct relation between global average temperatures and the concentration of greenhouse gases in the atmosphere, the key for the solution to the climate change problem rests in decreasing the amount of emissions released into the atmosphere. This can be done by transitioning from thermal power generation to solar, wind and small hydroelectric power generation, making buildings and appliances more energy efficient, switching to electric cars, promoting public transport and designing cities so that the people have to travel less. Developing technology for hydrogen fuel cells to produce electricity for small power plants and use in vehicles is also an option to reduce GHG emission. Along with these emission-reducing methods measures are to be taken to reduce the current concentration of carbon dioxide (CO₂) by enhancing sinks (e.g. enlarging forest areas and stopping deforestation, developing carbon capture and storage (CCS) technology for carbon sequestration). Efforts to reduce emissions and enhance sinks are referred to as “mitigation”. It has been suggested that carbon tax may be introduced to provide incentive to the corporates to change over to emission-reducing technology. The revenue generated from the tax should be spent for welfare of the low-income groups and afforestation.

Adaptation involves making adjustments to social, economic, and environmental practices to live with the damage caused by climate change. This includes building resilient infrastructure, developing early warning systems for extreme weather, planning for sea level rise, enacting new building codes so that houses are energy efficient or flood resistant, crafting new financial instruments to take care of losses due to climate-related disasters, promoting behavioural changes like shifting to new agricultural practices, promoting scientific research on tackling climate hazards. The metropolises have turned into heat islands as a result of global warming. Concrete multi-rises and

asphalt roads get heated quickly and retain the heat, so that they do not get cool even in the night. The cities are 2^o-4^o C warmer than the surrounding rural areas. Some adaptation measures for such situations are, (i) to have more green cover in cities (at least 20% of the total area); these may be tree lined streets, parks, grassy lawns, urban forests etc, (ii) to protect and expand water bodies, (iii) to have better insulated and ventilated buildings (iv) to have energy-efficient air-conditioners etc.

Climate change and capitalist politics

Climate change is a global phenomenon, and the efforts to combat climate change and its adverse effects should also be global. This realization led to the establishment of United Nations Framework Convention for Climate Change (UNFCCC) as an instrument for international negotiations. The annual Conference of Parties (CoP) is the decision making body.

The developed countries have the historical responsibility for the present accumulation of GHG through industrialization using fossil fuels, while the developing countries which suffer the worst due to climate change contributed the least towards GHG accumulation. For improving the quality of life the developing countries also aspire to tread the path of industrialization and thereby they would increase their GHG emission. The idea of common but differentiated responsibility was accepted in the Rio Summit of 1992, which stated that the developed world would be required to bear the major responsibility of emission reduction and would help the developing countries, through financial aid, technology transfer and capacity building, so that they can make a technology transition with less or no GHG emission and their right to development is not compromised. But the developed countries did precious little to reduce their own emissions or provide finance or transfer technology to the developing countries for

coping with the adverse effects of climate change and transition to a low emission technology.

It needs to be pointed out that the developed world reaped all the benefits of industrialization, and it is their affluent style that is responsible for the present elevated GHG concentration. The contribution of the poor developing countries to the total GHG in the atmosphere is minimal, but it is they who are the worst victims of climate change. Similarly, in all countries the poor, marginal people in the cities and villages are least responsible for CO₂ emission, but they are most affected by climate change, be it intense heat waves or droughts or storm surges or floods or coastal inundation. All policies to tackle climate change must keep the questions of equity, justice and fairness as their central concerns.

At the Kyoto Conference (CoP 3) in 1997 the developed world agreed to take on legally binding targets to reduce emissions, but the target set was a pittance and not enough. USA, a major emitter of GHG, did not even sign the Protocol. In the following years several summits were held but the climate negotiations became so ossified that they became almost purposeless. No progress was made on reducing GHG emissions due to the intransigence of the developed countries about emission reduction; rather the GHG emissions of countries like USA, Australia, Spain, Canada progressively rose after 1990. While talks were going on in the CoPs, the global CO₂ emission rose from 22 gigatons (gt) of CO₂ in 1990 to 37.55 gt of CO₂ in 2023. There were acrimonious arguments between the wealthy nations and the poorer countries about whose responsibility it is to address the issue of climate change, and how much support should be provided to the poorer nations to reduce their emission and to tackle the impact of climate change. India and China have the ambition to develop industry depending mainly on coal for power generation and their emission rose, though their per capita emissions were way below those of USA and Canada. The concept of historical

responsibility, equity and justice in climate policy was thrown to the wind in the Copenhagen CoP 15 (2009). The Paris summit of 2015 adopted the goal of keeping the temperature rise below 2° C, preferably below 1.5°C., and called for rapid, deep and sustained reductions in global greenhouse gas emissions, reducing global carbon dioxide emissions by 45 per cent by 2030 relative to the 2010 level and achieving net zero emission around 2050. In the Paris summit it was accepted that the countries would declare their voluntary non-binding emission targets—Nationally Determined Contributions (NDC). The hollowness of the NDCs becomes apparent when we note that the cumulated value of cuts by the developed countries amounted to 0.8-1.8 billion tons of CO₂ equivalents, while the developing countries agreed to cumulatively cut 2.3 billion tons of CO₂ equivalents by 2020. Thus all protocols are on paper only with the mighty imperialist countries flouting the norms with alacrity. The fact is that the carbon budget of the world has been appropriated by a few wealthy countries and only crumbs are available for the rest of the world. The UN warned in September 2021 that the countries' revised targets were too weak and would leave the world on track to warm by 2.7° C. Even the COP-28 held in 2023 in Dubai, noted with serious concern that progress was too slow across all areas of climate action – from reducing greenhouse gas emissions, to strengthening resilience to a changing climate, to getting the financial and technological support to vulnerable nations.

Another tricky point is the question of finance. The developing countries aspire to industrialize to improve their standard of living. For this they need funds from the developed countries to phase out fossil fuels, transition to renewable energy (solar, wind, small hydro), and follow pathways for low-carbon growth. But the developed countries are not very forthcoming to offer financial help to the poor countries affected by climate change. Wealthy countries promised in 2009 to

contribute US \$100 billion a year to a Green Climate Fund (GCF) till 2020 to help developing nations, but this did not materialize and the total portfolio of the GCF stood at only US \$ 13.5 billion in 2022. A positive development at Dubai in 2023 is the formation of a Loss and Damage fund to take care of the crippling losses suffered by countries and communities as a result of climate-change-induced extreme weather events. However in the Baku CoP the developing countries raised a demand for assistance to the tune of \$ 1.3 trillion annually, but the developed countries pledged only \$300 billion annually, a paltry sum.

Overall it has to be acknowledged that these international summits have not done enough to initiate effective and sustained coordinated action across the globe to restrict global warming below a certain agreed threshold, based on justice, equity and fairness. Nor is the demand of the developing countries for financial aid to facilitate transitioning to a low carbon economy effectively addressed.

Indian scenario

India is the 7th most affected nation by climate change. A National Action Plan for Climate Change was released on June 30, 2008. It had 8 missions to carry out the task, like National Solar Mission, National Water Mission, National Mission for a Green India, National Mission for Sustainable Habitat, etc. India's action plan against climate change was announced by Prime Minister Narendra Modi at the Glasgow CoP 2021. It was declared that the country would reduce total projected carbon emissions by 1 billion tons by 2030, would meet 50% of its energy requirement by renewable sources by 2030, would reduce the carbon intensity of its economy by more than 45% by 2030, and would achieve zero emission by 2070. But there is a disjunct between promises and ground reality. CIL, the near-monopolistic coal company in India produced 622.63 million tons (mt) of coal in 2021-22, and in

2023-24 it increased to 773.64 mt, and the target for 2024-25 is 838.00 mt. The import of coal increased during the same period from 208.93 mt to 261.00 mt. Thus far from phasing out the use of coal, as envisaged in Glasgow CoP, India has boosted up its coal production. India has made some progress towards installation of solar power, but there is a shortfall between the target and the installed capacity. In 2022 there is a shortfall of 32 GW from the target of 100 GW. India's projected power capacity by 2030 is 900 GW, of which renewable power would be 450 GW. From the present rate of progress it is doubtful if the target can be fulfilled within six years.

Moreover, to achieve net zero emission an important task is preservation and extension of the forest cover. The target was set up to create an additional carbon sink of 2.5 to 3 billion tonnes by 2030 through afforestation and reforestation. However, the new Forest (Conservation and Augmentation) Act of 2023 promulgated by the BJP government with a view to facilitating commercial exploitation of forest would lead to more diversions of forestlands. The Act exempts a host of infrastructural projects in forest areas from environmental scrutiny, and also allows some non-forest activities on forest lands, like running zoos and 'eco-tourism' facilities, as mentioned earlier. The performance of the Indian Government does not inspire confidence that it would be able to honour the promises made at Glasgow CoP.

Global warming issue was conveniently skirted during electioneering

What needs to be stressed is that such a serious issue found no place during the recent electioneering as all the bourgeois and petty bourgeois parties stressed in their manifestos on many other populist issues which, they counted, would fetch them vote. Installation of Ram Mandir found predominance in the BJP manifesto but not climate change. But

our Party, SUCI(C), founded, reared and steered by Comrade Shibdas Ghosh, an outstanding Marxist thinker of the era, did raise this issue with due concern. In the booklet authored by Comrade Provash Ghosh, our beloved General Secretary, and released as our Party's stand on the last parliamentary election, there is a section titled "What is behind the present-day extreme environmental crisis?"

In that section it was stated, "Why is the climate changing? Storms and cyclones are becoming more frequent. What is the reason? The scientists say that it is because the global temperature is increasing. Scientists have repeatedly warned that the concentration of greenhouses gases, carbon dioxide, methane and nitrogen oxide is increasing. This is leading to global rise in temperature. Because of this global warming the polar ice is melting, the Himalayan glaciers are melting. As a result sea-level is rising and large coastal areas are going under the sea. And the climates in different parts of the world are changing. In some regions there is excessive rainfall and flooding, in other regions severe drought and no sign of rain. ...the capitalists are doing nothing to reduce greenhouse gas emissions. In Northeast India, Uttarakhand and Kashmir the fragile natural balance is being destroyed for the sake of 'development'. ...Forests are being cut down and the native tribal populations are ousted from their habitat. Everywhere, be it the Andamans or the Sunderbans natural balance and biodiversity are being destroyed. Highways, factories and mines are being built in forest lands. All these are being done in the interest of the capitalists' profit. Let the world be destroyed, let civilization be annihilated, but the capitalists want their maximum profit. They are destroying the human civilization."

In conclusion we emphasize that it is the capitalist mode of production with its insatiable lust for appropriating

maximum profit that is responsible for the uncontrolled emission of GHG and the present climate crisis. Science is clear about the reality of climate change and about the anthropogenic causes that are responsible for it. We are now standing at the side of a precipice, and if we fail to act, the entire human civilization will be at peril, and the survival of mankind would be at stake. However, science has also suggested ways of combating climate change, and there is still time to take corrective actions. Here also capitalist relations of production, profit motive, capitalist competition and rivalry are standing in the way of a concerted united action. The need of the hour is organized drive to make the people aware of the reality of climate change, its causes and its impacts, and to build up movements in all countries so that the rulers are forced to take up science-based coordinated action to combat the menace of climate change. Climate action needs to be integrated with fight against capitalism.

COP29 — another failed climate summit

The COP29 Climate Summit in Baku, Azerbaijan, was meant to be a moment of collective reckoning—a turning point in the global struggle against threatening climate change. Yet, the summit, like many before it, failed to arrive at a consensus on working together for arresting reckless emission of carbon through unabated fossil fuel burning which release greenhouse gases like Carbon dioxide and Methane that cause global warming. This conference also was marked by the same contradictions among the various participating countries that have come to define the international climate discourse.

The overarching question that hung over COP29, as well as all previous climate summits, is whether there was any change in the aversion on the part of the mighty imperialist-capitalist countries like US to cut down carbon emission rates and release adequate funds to help the less developed countries to gradually switching to green fuel use. It bears recalling that the majority of greenhouse gases have been emitted by sources in energy production and transportation sectors (especially automobiles) in advanced imperialist-capitalist countries. Yet these big brothers continue to be reluctant in bringing down their own emissions. Instead, they continue to point at increasing emissions from the relatively less developed or developing countries.

Friction has been evident in the debates over what actions should be undertaken by the developed and developing countries on what schedules, and which participant country or countries should pay incremental costs for mitigation measures. For example, as research finds, the deadly Hurricane Helene

which ravaged Florida's Big Bend region of US in September last killing over 150 people, was greatly exacerbated by global warming, yet Donald Trump, the President designate of US continues to deny the climate crisis. Environmentalists worry that he will also dismantle flood protections and climate policy.

Fiasco of carbon market

It may be recalled that COP29 traversed a rocky path from the moment UN officials selected Petro-state Azerbaijan as the host nation. As climate scientists have pointed out, the primary focus at COP29 was on market-based solutions, rather than systemic change. What is market-based solution? It is designated as carbon market. Carbon markets are trading systems in which carbon credits are sold and bought.

Companies or individuals can use carbon markets to compensate for their greenhouse gas emissions by purchasing carbon credits from entities that remove or reduce greenhouse gas emissions. One tradable carbon credit equals one ton of carbon dioxide, or the equivalent amount of a different greenhouse gas reduced, sequestered or avoided. When a credit is used to reduce, sequester, or avoid emissions, it becomes an offset and is no longer tradable.

But, as has been experienced, carbon trading allows advanced imperialist countries to bypass actual reductions in their carbon footprints by purchasing cheap carbon credits from poorer countries. This dynamic sustains the exploitative status quo, where the environmental cost of capitalist growth is externalized onto the global poor. The carbon credit system, promoted as a solution to offset emissions, is a classic case of "greenwashing", a mechanism that allows corporations and wealthy nations to buy their way out of environmental responsibility, without curbing the root causes of climate change.

In fact, because of a kind of commodification of nature—encapsulated by carbon markets, ecological stewardship is reduced to a mere financial transaction. This framework

perpetuates exploitation, especially in the Global South, where communities bear the brunt of environmental degradation while many of the Global North (advanced imperialist-capitalist countries) including US are merrily shirking their responsibilities towards reducing global warming.

From a scientific perspective also, carbon markets have long been criticized as ineffective and deceitful. Research consistently shows that these markets often fail to achieve real reductions in emissions. Rather than addressing the structural causes of climate change—fossil fuel reliance, and unsustainable production practices driven by consumerist culture, use and throw, and overconsumption—carbon markets offer a false sense of progress.

The Intergovernmental Panel on Climate Change (IPCC) has made it clear that the emissions trajectory of the past few decades is incompatible with limiting global warming to 1.5°C, yet the failure of carbon markets to deliver substantive results was barely addressed at COP29. Instead, there was an overwhelming emphasis on expanding these markets, presenting them as a panacea for the climate crisis. This fixation on market solutions as per prescripts of capitalist globalization-liberalization ignores the inconvenient truth: capitalism thrives on profit maximization which accrues by way of ruthless exploitation of both human labour and natural resources. So, the climate crisis is not a minor side effect of economic development—it is a creation of the capitalist system.

Climate Justice and the issue of reparations

The COP 29 ended in overtime on 24 November 2024 with only modest climate finance goals and failed to deliver on an expected announcement of a new commitment to cut greenhouse gas emissions, and displayed unusually high tensions among nations, spurred in part by statements from the host, Azerbaijani President Ilham Aliyev, that oil and gas was a “gift from God.” The result was deep concern among climate policy

activists for the future of climate diplomacy and so the outcome of the summit reflected a chilling reality that greed for profit maximization by the global monopolist sharks and giant multinationals has reached such an extent that even such a menacing threat to survival of human civilization is of no concern to them.

In fact, from the perspective of climate activists, COP29 has been detrimental to the less developed or developing countries of the global South. Despite the rhetoric of climate justice, the summit offered little more than symbolic gestures and unfulfilled promises. And now, so many years later, for small island states, already bearing the brunt of rising seas, the calls for financial reparations—\$39 billion annually for island countries and \$220 billion for less developed countries—were ignored. These nations, who have contributed the least to climate change, are now expected to shoulder the greatest burden, all while wealthy imperialist countries like US continue to prioritize their own profit-greed by renouncing their responsibility for lessening climate crisis by bringing down fossil fuel burning and providing due financial assistance to the less developed or developing countries to adopt measures to contain carbon emission.

The demand for climate reparations is not just about money; it is a demand for accountability and a recognition of the historical process and injustices that have led to the current crisis. Activists argue that wealthy nations, having built their wealth on the excessive use of fossil fuels at the cost of climate health, must now take responsibility for the ecological debt they have incurred. Yet, at COP29, the financial mechanisms proposed for climate finance remained woefully inadequate.

Developed countries renege on promise to provide financial assistance

In 1992, when the first climate summit was held in Rio de Janeiro, Brazil, it was decided that the developed countries

would shoulder the financial responsibility for implementation of climate-related measures of under-developed or developing countries by 2020. In Copenhagen summit in 2009, it was agreed that the developed countries would provide financial assistance to the tune of \$10,000 crore per year to the developing countries per year. But that was delayed by two years. Secondly, 2/3rd of the contribution in the two post-pandemic years had come from private sectors as loan at exorbitant interest. In other words, the pandemic-ravaged under-developed or developing countries were forced to depend on the usurious capital. In Paris summit of 2015, an agreement named 'New Collective Quantified Goal' was arrived at. In Baku conference, it is claimed that a distinct policy framework and implementation details of that agreement have been chalked out. The conference fixed the amount of financial assistance to the developing or under-developed world at \$30,000 per year as against \$10,000 crore till 2035. But this sum is much lower compared to the requirement of at least \$1,00,000 crore per year. According to the 'Standing Committee on Finance' of the conference, if the climate-related national-level programmes of 93 developing or under-developed countries are to be implemented, at least \$5,00,000 to \$7,00,000 crores of funding is necessary. Based on that estimate, two private lending agencies have stated that for 129 relatively non-advanced countries, the money required will be as high as \$7,80,000 to \$ 13,60,000 crore. Going a step ahead, United Nations conference on Trade and Development has said that required financial assistance would be \$1,55,000 crore by 2030.

At the COP 28 in Dubai in 2023, there was a consensus that a sum of \$74,90,000 crore would be contributed by 26 countries to achieve that goal. However, not even 20% of that promised contribution has come till 2024. USA has provided just 13.6% of its commitment. In fine, because of the reluctance on the part of the developed countries to release required fund,

very little, if not miniscule, progress has been made in putting in place effective measures to contain global warming and related climate issues.

COP 29 has been a damn failure

The summit failed to recognize that the climate crisis cannot be separated from the economic and social structures that govern human life. As urban population swells, inequality deepens. The poor, especially marginalized communities, are left to suffer the worst effects of climate change, while the wealthy remain insulated in climate-controlled spaces. The rhetoric of “leaving no one behind” was conspicuously absent in the concrete policies presented at COP29. As modern cities become hot islands which is another factor in climate crisis, the social fabric of urban life is torn apart by inequality—the rich insulating themselves by creating protective shield like living in air-conditioned surrounding and avoiding exposure while the poor face the vagaries of global warming and deteriorating climate condition, and that too in the midst of the havoc wrought by unprecedented pollution. Incidentally, there ought to be a word on thriving tourism industry a major source of carbon emissions, in which the rich countries find a new avenue for reaping huge commercial gains, has long been ignored in climate discussions. Yet its environmental impact is undeniable. The rebound of tourism to 90% of pre-pandemic levels highlights the capitalist priorities that continue to dominate global economic policy. While the summit acknowledged the carbon footprint of tourism for the first time, it did little to offer substantive, enforceable measures to reduce its impact.

The tourism industry’s unsustainable practices, fuelled by the demand for cheap flights and luxury travel, epitomize the contradictions of a global economic system that prioritizes profit over sustainability. Tourism, like fossil fuel extraction, is driven by the pursuit of profit, not by any genuine concern for ecological balance or social well-being. The short-term

economic benefits of mass tourism are measured in billions, but the long-term environmental cost—overcrowded cities, depleted resources and polluted ecosystems—is hardly ever factored into the equation. Without structural changes to the global economy, which must include the regulation of industries, be it tourism, or a host of others, any progress in climate action, that is to say, actions for mitigation of and adaptation to global warming will remain superficial.

So, it is not enough to implement technical solutions to reduce emissions; genuine climate action must address the underlying social and economic inequalities that drive environmental degradation.

A Marxist critique of man-made climate crisis

The climate crisis, when viewed on the anvil of scientific methodology of analysis ingrained in Marxism-Leninism, the highest ideology of the time, would be found to be not merely an issue of environmental protection or technological innovation—it is a consequence of capitalism's inherent contradictions. Capitalism which is based on exploitation of human labour for the sake of profit and driven by the need for constant growth in profit necessarily leads to the rapacious exploitation of natural resources. The commodification of nature, seen in the expansion of carbon markets and carbon credits, is a prime example of this dynamic. The natural world is reduced to a set of transactions, measured in terms of market value, while the ecological costs of exploitation are externalized.

Enmeshed in an unsolvable economic crisis endemic of the system, the imperialists-capitalists are now desperately trying to prolong their inevitable doom by taking recourse to acts which are not only inimical to people's interest but pose a serious threat to survival of human civilization. For example, the role of tourism in the climate crisis was another key issue raised at COP29.

Evidently, capitalism's drive for profit maximization leads to the degradation of both people and the planet. In the climate crisis, the richest nations, responsible for the bulk of historical emissions, continue to maintain their dominance over global resources, whereas the relatively underdeveloped Global South is left to bear the brunt of the crisis. The expansion of carbon markets and the continued reliance on capitalist growth models show that, rather than confronting these contradictions, COP29 sought to accommodate them.

Criminal neglect of crucial climate crisis

The legacy of COP29 will ultimately depend on whether the promises made in Baku are translated into meaningful action. Yet, based on the evidence presented at the summit, the likelihood of genuine progress is slim. The financial pledges made to developing nations are inadequate, carbon markets remain an unregulated farce, and social inequalities continue to be sidelined in favour of technocratic solutions that offer little more than incremental change.

In the final analysis, the climate crisis is not a distant threat—it is a present reality that demands radical, transformative change. The false hope offered by COP29 is merely another chapter in the long history of international climate summits that prioritize profit and power over people and the planet. To avoid ecological collapse, we must confront capitalism's inherent contradictions head-on. Until then, the powerful imperialist-capitalist countries will continue to tinker with solutions that perpetuate the very systems of exploitation that have brought us to this precipice.
