

Global Warming, its Global Impacts and Capitalism

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Kids in my village Adve had a tough time bursting crackers on Diwali last year. This was not surprising, because it had been raining and the crackers were not sufficiently dry. The surprise though was that it was raining at all.

The village is located near the coast in southern Karnataka, between Udupi and Bangalore. The regular monsoon in this coastal belt usually lasts about three months.

In 2007, it rained for five months, all the way up to Diwali in early November. It is unheard of in this region. My aunt, who has lived here for 20 years, and two elderly relatives aged 75 and 80 years, said they had never experienced anything like it.

Though one cannot link every aberration in weather to global warming, irregular rainfall patterns are very much among its predicted impacts. But what actually got me going on the subject with them was that everyone said: "It's been bad this year", when asked how things were.

It was bad because the excessively long monsoon affected the paddy crop, the most important crop in this fertile belt. Harvesting and threshing of paddy happens immediately after the monsoons when the crop gets dry. With continuing rains, farmers are unsure whether to leave it in the fields, where if it is left for too long, either insects get to it and/ or the grain falls off. To harvest it when still wet is also a problem since the crop first needs to dry adequately before threshing else some parts simply rot. Everyone I asked told me their yield fell by 30-50 per cent. Landowners complained about higher wage costs: since the paddy crop was wet, it took the farm labourers a longer time to transport it from the fields.

Global warming, global impacts

I started off with this narrative about my village simply because there is not enough information on how global warming is already impacting people in India, particularly the poor. The flow of information is mostly anecdotal as above. Some gets reported. In Rajasthan, frost and irregular cold conditions this January affected the standing crop – mustard and gram in particular – in 10 lakh hectares over 22 districts, prompting farmers to approach leaders for relief from the Calamity Relief Fund (*Hindu*, 3 February 2008), forcing the state government to respond.

The connection between current impacts and global warming has to be made clear and placed in the public domain by the government and civil society groups, so that varied impacts in different regions, topographies and climatic zones can be better anticipated and prepared for. A clearer sense of detailed impacts would also help mobilise around the issue.

The impacts of global warming have been truly global and extraordinarily varied. The average rise in global temperatures may seem small – 0.8 degrees C since the Industrial Revolution in roughly the mid-18th century, the Earth's average temperature reaching 14.5 degrees C in 2005 – but this is only an average. The farther one goes from the equator, in northern latitudes in particular; the rise is much higher.

The warming so far has caused lands to be nibbled by rising sea levels in the Sunderbans and the Gujarat coast, the 2005 floods in Bombay that killed a thousand people, and the Himalayan glaciers to recede. Millions were affected by floods in 2007 in South Asia alone.

The WHO says that an extra 150,000 people are dying each year due to global warming. It has caused flooding in Yugoslavia, Serbia, Romania and Bulgaria, droughts in the Sahel in Africa, Hurricane Katrina in the US, forest fires as far afield as Greece, Spain, Australia, near Los Angeles and Portugal, melting glaciers worldwide, recorded loss of species, the shrinking of Arctic Ice to historical lows, accelerated melting in Greenland and Antarctica, more intense hurricanes in the Caribbean, the melting of permafrost that had remained frozen since the last Ice Age ended 12,000 years ago.

It has caused a northerly shift of fish species in Europe, an upward shift in the growth of apples on hills in Himachal, decrease of rice yields in the Philippines, increases in tick-borne encephalitis in Sweden, chikunguniya in Italy, the greater spread of malaria in highland areas of Kenya, formation of large lakes due to glacial retreat in Nepal, the Andes and the Alps, and increased frequency of glacial lake outburst floods in Nepal, Bhutan and Tibet. It has affected things as vast and fundamental as ocean currents, the length of seasons, and rainfall patterns (Brown 2006; IPCC 2007b: 86-99; Lynas 2007; Monbiot 2006). I could go on and on.

It is not usually understood that current impacts described above or what we are already experiencing are the effects not of current emissions, but of carbon emissions from about 25-30 years ago. It takes those many years for carbon dioxide in the atmosphere to achieve its full effect (Brown 2006: 45).

Carbon emissions and more

This is mainly because the vast oceans, being cooler than the atmosphere, and because water's thermal capacity is much higher than the atmosphere, take a while to warm and catch up. We are already at 0.8 degrees C above the Industrial Revolution, but because of this lag in the climate system, a further warming of about 0.7 degrees is built in. Hence reaching 1.5 degrees C, almost twice the current levels of rise, is assured even if we stop emitting gases today. There is nothing we can do about it, nor can we avoid further, more intense or more frequent impacts.

Emission levels have been also intensifying in recent years. Worldwide CO₂ emissions *from fossil fuels* were 21.39 billion metric tonnes (Gt) in 1990 (the benchmark year to

measure cuts), were 22.97 Gt in 1997 when the Kyoto meeting happened, 26.40 Gt a year over 2000-2005, and reached 28.19 Gt in 2005, when the Kyoto Protocol was finally ratified (EIA 2007; IPCC 2007a: 3). The big sources of these emissions are electrical power (24%) industry (14%), and transport (14%). Even agriculture contributes 14%, but agriculture is vastly more useful socially than the 800 million cars plying in the world at present: billions depend on agriculture for livelihood and all of us for our food.

Finally, a further 7-8 billion tons of CO₂ and other gases get emitted due to land use changes (18%), which mainly happen due to deforestation, burning and decay of biomass, decay of peat and peat fires. In India, industries are destroying forests due to mining, commercial logging, etc. If we take deforestation and land use changes worldwide, a staggering amount has happened (EPW Research Foundation 2008: 89) in Brazil (1.11 billion tonnes of CO₂ a year between 1990-2005) due to deforestation from the Amazon, and in Indonesia (2.27 billion tonnes a year 1990-2005) mainly due to the destruction of forests to grow biofuels. In both cases, the primary consumers are first world elites in the US and Europe.

Besides CO₂, methane and nitrous oxide are the other significant greenhouse gases. A couple of important points about greenhouse gas emissions. One, emissions anywhere in the world hurt everyone equally. Two, roughly half the emissions get absorbed by oceans and forests; the rest remain in the atmosphere. Three, methane and nitrous oxide warm more than CO₂ but have shorter life spans. Carbon dioxide has a lifespan of thousands of years: about a half of it stays in the atmosphere for a hundred years, a third for over 500 years and a quarter for over a thousand years.

Because of human activity, CO₂ has jumped from 280 ppm at the start of the Industrial Revolution to 385 ppm at present, much of it in the past few decades. Some emissions, aerosols such as sulphate, organic carbon, soot, etc. cool the planet by blocking sunlight. As the excellent website *realclimate.org* recently explained, factoring in the warming and cooling effects of other emissions, that figure stood at the equivalent (CO₂e) of about 375 ppm in 2006, and is going up by at least 2 ppm each year (Schmidt 2007).

Feedbacks and the 2-degree tipping point

The warmer earth is triggering off certain ‘feedbacks’, which could be understood as the earth itself contributing to warming. As Arctic ice melts, there is less of it to reflect heat, and thus causing further warming. Warmer Antarctic and Greenland ice sheets create meltwater on the surface, which being darker than ice, absorbs more heat. Warmer soils accelerate metabolic processes that allow carbon dioxide in soils to escape. Melting permafrost in the Arctic Tundra will release CO₂ and methane trapped within.

Recent studies published in *Nature*, *Science* and elsewhere suggest that oceans are currently absorbing less than they were a few decades ago (Archer 2007). Each of these elements has separate tipping points, of which the Arctic is imminent. A recent conference of the American Geophysics Union suggested that it may have already tipped (Raypierre 2007), meaning that in the not too distant future the Arctic will have no ice in

summer. Since Arctic ice acts as a huge reflector, the less there is of it, the more warmth will be absorbed by the sea water around and by the Earth.

These feedbacks are crucial. It's fairly widely accepted that were the Earth to become roughly 2 degrees warmer than pre-Industrial times – 1.5 degrees, remember, is assured – it would catalyze feedbacks together on a scale so massive that global warming could get beyond the human capacity to control.

But there is uncertainty as to what levels of CO₂ correspond to what levels of warming. Hence we don't really know when 2 degrees will be reached. Some say we have barely about 20 years to prevent dangerous global warming. The UK's *Stern Review* puts the date at 2035, but it is calculating 2 degrees at 550 ppm CO₂e (Stern 2007: iii). To be safe, we need to restrict ourselves to 400 ppm CO₂; we already are at 385 and are rushing there at over 2 ppm a year. James Hansen of NASA's Goddard Institute for Space Studies – one of the world's most respected climatologists – has said we have until 2015 to avoid dangerous levels of global warming in the future, less than ten years.

Impacts in India

One massive area being impacted and clearly visible to all is the Indian monsoon – once natural and now fickle. Bill McKibben lamented in *The End of Nature* nearly 20 years ago (McKibben 1990: 45). A recent widely reported paper spelt nine major tipping elements, “subsystems of the Earth system that are at least subcontinental in scale and can be switched into a qualitatively different state by small perturbations” (Lenton, et al 2008). These include, significantly, the Indian summer monsoon.

Lenton suggests that the Indian monsoon could potentially change its nature strikingly from one year to the next. Aerosol emissions, mentioned earlier, could well weaken it whilst warming from greenhouse gases tends to strengthen it. It leads to what is essentially a chaotic monsoon year on year that is able to switch 'modes' with aerosols and warming, pushing it in different directions. There is reason to believe that the tipping point for the Indian monsoon may have already been crossed or is imminent. The implications of this for agriculture in particular are obvious.

Another major impact in India is going to be reduced water availability. Overuse by industry, change in agricultural cropping, and excess pumping of groundwater have already resulted in water scarcity for millions, and in many places the drying of small rivers. As it is, access in India to irrigation and drinking water is mediated by one's caste, with dalits having the least access and 118 million homes – 62% of our households – already do not have drinking water at home.

This situation is going to worsen. A study of 466 glaciers, which included small mountain glaciers and ice fields in “three highly glacierized basins of Chenab, Parbati and Baspa” in Himachal Pradesh revealed a 21% reduction in glacial area from the middle of the last century, from 2,077 to 1,628 square kms, reduction in mean area from 1.4 to 0.32 sq km, fragmentation of glaciers that is “much higher than realized earlier”. The study concludes

that if additional global warming takes place, it “will have a profound effect of availability of water resources in the Himalayan region” (Kulkarni, et al 2007: 74). New data by Anil Kulkarni from Warwan and Bhut river basins confirms this (*Hindu*, 28 February 2008).

It would be shortsighted for urban dwellers far from the Himalayas to think that they won't be affected since it will widely affect water and food supply, and so much of India's electricity is hydropower. Impacts are certainly mediated by class, but global warming has the potential to affect *everybody*.

Global warming can also cause “increases in the occurrence of intense tropical cyclones and high [storm] surges”, something that has been already witnessed in the Bay of Bengal during November (Unnikrishnan, et al 2006: 362). A slower but catastrophic change is and will be the sea level rise.

This has been much sharper worldwide, over 3 centimetres a decade since 1993 (IPCC 2007c: 1). Already, villagers on Gujarat's coasts, in eastern Orissa and in the Sunderbans have seen their lands, wells and homes eaten away by rising sea levels. In areas of the Sunderbans, erosion started 35 years ago, some islands such as Lohachhara disappearing 25 years ago. Today, Gobardhanpur village, Suparibhanga island, southern Sitarampur village and most of fertile Ghoramara island only exist in the memories of “10,000 environmental refugees [who] struggle for survival here” (Mukherji 2008).

The IPCC has predicted a max rise of 59 cm by the end of the century. It says those subject to flooding will increase from 13 million to 94 million and “60% of this increase will occur along coasts from Pakistan, through India, Sri Lanka, and Bangladesh to Burma” (IPCC 2007b: 484). But the IPCC's estimate of sea level rise is considered too low a figure. James Hansen has said IPCC's analysis “assumes an inertia for ice sheets that is incompatible with palaeoclimate data and inconsistent with observations of current ice sheet behaviour.” He says the last time the planet was 2-3 degrees C warmer (which is a certainty the way we are going), “it was a dramatically different planet then with no Arctic ice in the warm seasons and the sea level [was] about *25 metres higher, give or take 10 metres*”. He wagers that it is far more likely that sea levels will rise the better part of 5 metres by the end of this century! (Hansen 2007: 32; Hansen, et al 2007)

India has over 7,000 kilometres of coastline, and if the rise is even half of what Hansen predicts, can one imagine the relentless impact, physical and psychological, it will have on fisher folk, small coastal cultivators, and the millions of urban poor in India's populated coastal towns and cities? And some of India's most fertile regions – where a lot of India's rice grows – lie along the coasts and deltaic regions. All of this – irregular monsoons, less water, rising sea levels – will badly impact agriculture.

A recent study by the Indian Agriculture Research Institute found that increases in temperature by about 2 degrees C “reduced potential [wheat] grain yields in most regions”, and that “overall, temperature increases are predicted to reduce rice yields”, the impact on rice yields being most in eastern India. Even the IPCC, scarcely alarmist, says

“a 0.5 degree C rise in winter temperature would reduce wheat yield by 0.45 tons per hectare in India” (IPCC 2007b: 480).

Non-solutions and capitalism

In the last 250 years, resource exploitation, trade, markets, warfare, consumption, technological development, mining, etc have happened at a rate, intensity and geographical scale unprecedented in human history. Anyone who doubts the umbilical links between global warming and capitalism should look at the recent rise of emissions from fossil fuels in China, from 3,050 million metric tonnes in 2001 to 5,322 mmt in 2005 (EIA 2007).

As a consequence, the long-term trend of declining CO₂ emissions per unit of energy supplied reversed and rose after 2000 (IPCC 2007c: 4). This mirrors the changing contours of capitalism; by the 1990s, goods that were still being consumed by First World and other elites began to get manufactured in China as capital searched for cheaper labour markets and lower input costs.

This centrality of capitalism as cause and constraint has certain implications for how we look at global warming. We need to expose the limitations and sometimes fraudulence of looking at it through the lens of the nation-state, and instead place class, elite consumption and capitalism at our conceptual core. Global warming is a problem caused by the rich, but which will be borne largely by the poor.

When the Indian Prime Minister says that “India’s’ per capita emission levels will never be higher than western countries,” it hides the enormous disparity in incomes and consumption that have intensified in India in recent years. This trajectory is one in which economic ‘growth’ benefits a section of urban elites, even as official reports admit that over 800 million people consume less than Rs 20 a day, and someone who consumes so little can hardly contribute to global warming. Class, and not nation, is central to global warming.

We need to recognise the limitations of technological solutions *under capitalism*. Don’t get me wrong. Some of these technologies – solar, wind power, etc – will reduce CO₂ levels, will help delay its impacts, and will undoubtedly play an important part in more equitable social arrangements. But why is it that these technologies are not being and have not been implemented on a scale large enough to solve the problem?

John Bellamy Foster tells us why: “At every point, capitalists have blocked the implementation of solar power alternatives. ... Under capitalism, it is those energy sources that generate the most profits for capital – of which solar power is certainly not one – that are promoted, not those most beneficial to humanity and the Earth” (Foster 2003: 100).

It is the inherent tendency of capitalism to opt for the cheapest inputs. Why else would China, despite facing staggering environmental disasters, continue to build coal-powered plants at its current rate?

Capital is also trying to make money out of the crisis, by creating carbon trading, and by pushing some very dangerous policies as contributing to a solution - biofuels and nuclear power in particular. Each certified emission reduction (CER) unit – for each tonne of CO₂ notionally saved – is currently trading at 13 euros, around Rs 750. Its global market is currently worth US\$ 70 billion, estimated to reach \$100 bn in 2 years, of which India's share will be 25 billion dollars (D'Monte 2008). Carbon trading benefits the bigger polluters and is nothing but a way to make money while business and elites carry on their unsustainable levels of consumption. What's more, it actively works against the drastic cuts in consumption and emissions that are needed so urgently to ensure we do not reach dangerous levels of warming.

Biofuels, palm oil, maize and jatropha plantations have expanded with the EU and US setting higher targets for biofuels in their fuel mix. The consequences have been massive emissions from deforestation to grow palm oil in Malaysia and Indonesia. These crops also consume huge amounts of water and use land that could otherwise be used for basic foods. It has contributed to spiralling prices of wheat, rice and maize worldwide, sparking protests in Mexico and elsewhere. Should we be diverting resources on this scale to feed cars rather than feed people?

Nuclear power is routinely prescribed as contributing to a solution even though it will be only a tiny percentage of power generation, and has obvious, serious hazards: the real possibility of serious nuclear accidents; nuclear waste being recklessly dumped, as happened in the UK (Monbiot 2007: 91); the long-term problem of nuclear waste; finally, the spread of nuclear power is more conducive to the proliferation of nuclear arms because of the fine technological line between nuclear power and weapons. In all three cases – carbon trading, biofuels and nuclear power – only sections of capital will stand to gain, but consumption will continue and emissions will grow.

Equity is the only road

We must recognise that global warming is capitalism's greatest failure; it is the deepest crisis ever faced by humanity and innumerable other species. Real solutions to this crisis are not possible from within capitalism. We must focus on an entirely different trajectory of development, one that has equity, sustainability, respect for nature, and a fair space for other species at its core.

In India, this means, any meaningful development has to start with agriculture, for which land reforms and land distribution are central; but small-scale agriculture also needs to be made viable. It also helps that agriculture has lower emissions than most other human activity. Two, we need to question the mainstream focus on growth as the marker for a successful development experience. Recent years shows us that high growth can happen with little employment generation, skewed resource allocation in society, and can only be

accompanied by and because of inequality in society. Three, the current industrialisation route is to some degree environmentally unsustainable, and wasteful in its consumption of resources that could otherwise be used in agriculture or for basic needs of land, water and power. The vibrant struggles taking place around SEZs, in Nandigram, against Posco, against diversion of dam waters in Orissa, against displacement and corporate capture of people's resources all over India suggest that this point is being made by millions of people. Unfortunately they are being met, not with dialogue, but repression by governments.

When we say all this to students and at meetings, we are asked: Are you against industrialisation, against development? No, but we argue for equitable development, and a more appropriate industrialisation that is more in tune with people's basic needs, and produces what is socially absolutely necessary, has ties with agriculture, and one that generates greater employment locally.

A more sustainable pattern of development, and a reduction of the global warming crisis, is only possible if the unsustainable levels of elite consumption are curtailed. We are right to blame capitalism but the system is not just out there, it also seeps within us. The principle and goal ought to be equal emissions per person with lowered targets. Conversely, saner levels of consumption are only possible in a development trajectory that is more equitable than the present.

The key to the global warming crisis lies in equity, and the transcending of capitalism. It also requires us to abandon the faith in technological progress as the solution to all of society's ills and shortcomings, to restore balance with nature, to reduce consumption to what is absolutely necessary, to reduce speed in our daily lives, and to reflect and have more time to reflect. Unfortunately we now have very little time and no choice left.

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