# Combatting Climate Change Denial*

*Abhinaba Das*

**Despite the scientific consensus on the issue of climate change, we are yet to marshal a social consensus. Sorting this apparent dissonance is a challenge. The topic of climate change has become entrapped in so-called economic and socio-political wars. Scientific miscommunication has thwarted efforts to effectively engage with the public on this issue. If we can actively seek out the reasons that motivate denial, and try to understand the underlying structure that engenders misinformation, then perhaps we can find ways to address them. There is an acute urgency to better strategize climate change communication. The scientific community should recognize the need for new pathways of effective communication. In summary, we need to adapt. The faster we affect a change, the better chances we have at avoiding a catastrophe. Time is of the essence!**

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Currently, we are facing a crisis that threatens our survival as a species along with the survival of global flora and fauna. Despite ample independent assessments pointing towards the fact that humans are responsible for the recent warming of the globe, greenhouse gas emissions from anthropogenic activities are still on the rise. Policies to adequately and effectively address the issue are floundering. Public opinion survey shows that levels of climate concern and awareness vary greatly across the world. [1] Disparity in perceptions of climate change (see *Figure* 1) also exists in India, a country greatly vulnerable to the effects of climate change. This state of public opinion raises critical questions as to the effectiveness of the approaches towards climate change communication. To render any meaningful and constructive action, achieving a consensus among the masses and fostering public en-

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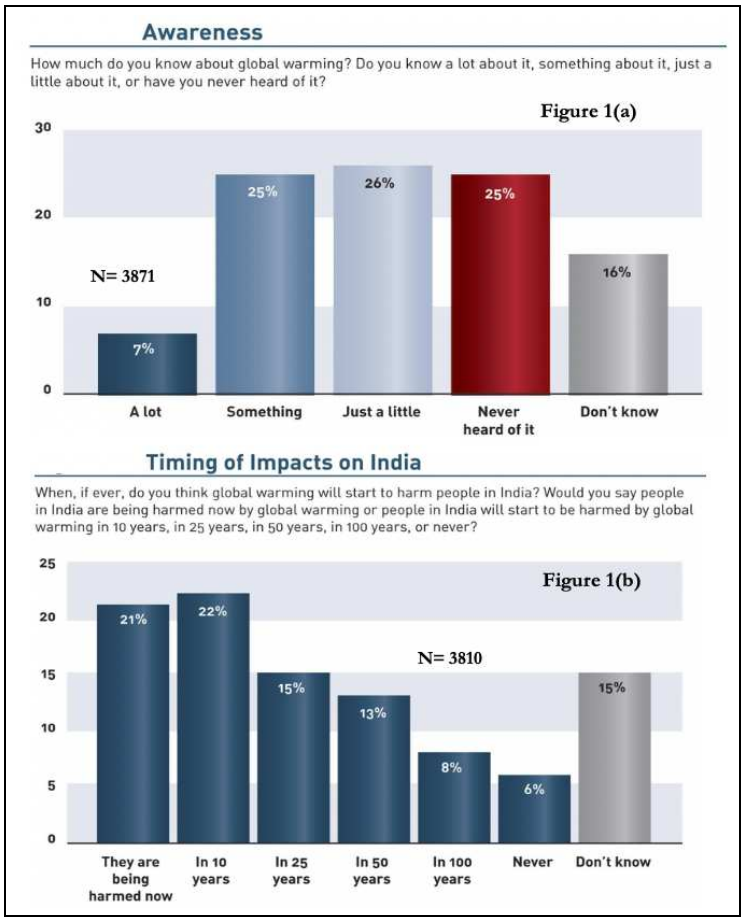


**Figure 1.** Based on a climate change awareness survey conducted in India, a majority of respondents are almost unaware of global warming (1a) or believe that global warming has not affected us yet (1b). (Source: *Yale Project on Climate Change Communication*, 2012)

gagement with climate change is essential since public opinion has a profound impact on public policy.

Concerns relating to climate change are not new [2]. However, policies have always aimed to promote socio-economic growth. And, unfortunately, this has happened at the expense of the environment. Over the past decades, the levels of greenhouse gases in the atmosphere have only been rising (*Figure* 2). The atmospheric mixing ratio of $CO_2$ has increased by about 100 ppm (36%) over the last 250 years. The average growth rate of $CO_2$ during 1995–2005 was 1.9 ppm per year—highest since the beginning of continuous direct atmospheric measurements in the 1960s. Such facts

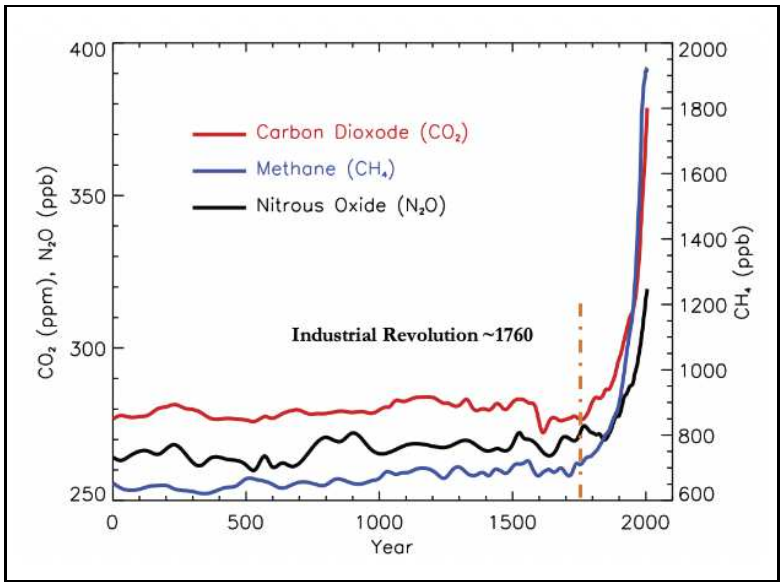


**Figure 2.** Changes in the atmospheric concentrations of $CO_2$, $N_2O$ and $CH_4$ over the last 2,000 years. The marked increase since about 1750 has resulted from anthropogenic activities. (Source: *IPCC Report*, 2007)

highlight that under the current state of affairs, climate change is not the top priority of global superpowers but economic growth. Increasing energy demands to achieve economic growth has resulted in profligate use of fossil fuels.

Global oil consumption has reached a new high, and global demands are expected to peak not before 2040 [3]. A tell-tale sign of the nexus among fossil fuel use and economic growth is the massive increase in the global $CO_2$ emissions soon after the 2008 global financial crisis, to put the economy back on track [4].

Economic growth is generally determined by four main factors: human resources (increase in the size of the active population; investment in human capital example investment in education), natural resources, capital formation, and advancement in technology. These factors may share a complex interdependence. For example, the availability of natural resources directly contributes to the success of industrialization which promotes economic development. However, industrialization adversely affects the environment and also leads to the depletion of natural resources. It can cause inequality in human capital formation since large-scaled

mechanical industries replace unskilled workers, thus increasing the number of rural unemployed workers and decreasing the demand for labour. An economic slowdown will aggravate problems like poverty, unemployment, and lack of adequate healthcare (to name a few) while climate deterioration, a by-product of this traditional economic model, will only intensify these problems, as such the current economic model needs to change. A more scientific and technologically integrated economy with a lower environmental footprint needs promoting for fostering sustainable development and ensuring environmental conservation. Moreover, it should be noted that such a change in the global economic infrastructure will not result in a lower living standard or lower growth rate as evidenced by the 'decoupling' of $CO_2$ emissions and economic growth in various countries, *Figure* 3 [5, 6]. A low carbon economy is a great opportunity for growth. Many profit-making giant corporations like General Motors, Nike, Walmart, etc, have invested in sustainable strategies with considerable revenue growth. Investing in the renewable energy sector has the potentials to create more high-paying jobs than expanding fossil-fuel-based plants, thus having a net positive effect on employment.

But how do we bring about this transformation? Given that modern economic development has been brought about by the burning of fossil fuels, there exists a political-economic barrier to change. This restraint, however, can be overcome by creating 'climate consciousness' among the public with a hope of achieving groundswell support for carbon neutrality. However, studies demonstrate that merely educating the public or instilling fear and guilt will not cause any dramatic shift in public attitude [7]. The prevailing approach of climate change communication relies on presenting volumes of sound data on the assumption that the apparent public apathy over climate change is a result of a lack of information. Dissemination of knowledge from experts to public hopes to ameliorate public attitude, behaviours, and beliefs, but there is little evidence that this is so. Strikingly, improved 'scientific literacy' amplifies levels of scepticism rather than an


**Figure 3.** "Decoupling" of $CO_2$ and economic growth. Some countries have succeeded in decreasing their $CO_2$ emissions while growing their GDP. (Source: World Resources Institute)

increased level of concern about climate change [8]. This particular study caught newspaper headlines, one of which read 'Global Warming Sceptics are BETTER-Informed about Science than Believers' [9]. It is important to note that much of the public understanding of scientific issues, especially climate change, comes through various media outlets [10, 11] When science leaves the laboratory and reaches the public through such mediations, it is often misrepresented. The aforementioned study did not take into the picture subjects' understanding of climate, and largely fo-

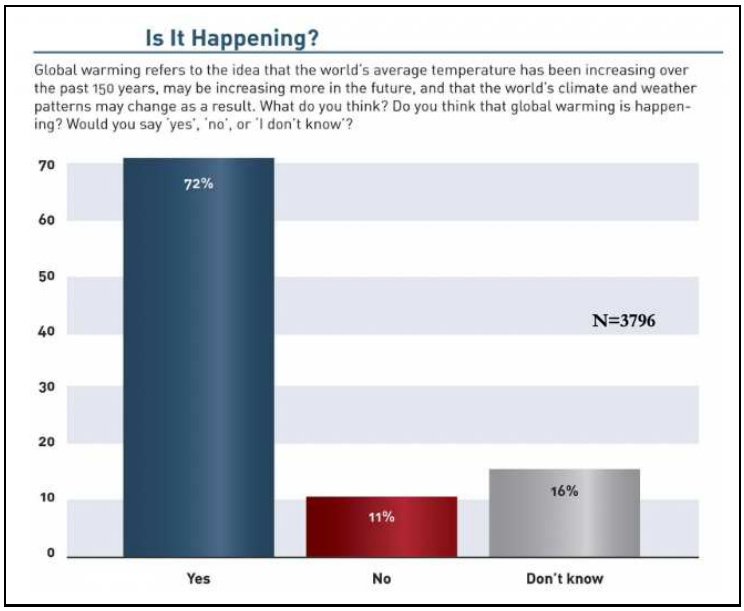


**Figure 4.** When defined global warming, 72 percent said that they believe it is happening. (Source: *Yale Project on Climate Change Communication*, 2012)

cused on subjects' scientific literacy and numeracy. The results were a direct consequence of how knowledge was measured. The highlight of the study was how individuals were well-equipped in forming beliefs consistent with their personal interest and identity. However, these facts seemed to elude the press.

Local media can cover environmental issues more widely compared to the national media. When the crisis is viewed as a domestic one, it can be more appealing since an individual's sense of identity is closely tied to a place one lives. Hence building a trusted relationship between scientist and local media can be an effective approach to foster individual engagement and bridge the science-action gap.

Climate change may well be the most formidable challenge humanity ever had to face. And there is trouble conveying the urgency of the message to the public and policymakers. The need of the hour is to better strategize communicative practices to ensure maximum public engagement and knowledge dispersal. In the Indian scenario, the acceptance of global warming increased when the public was made aware of the issue (*Figure* 4). Thus, it can be beneficial to just inform individuals about climate change, its causes and potential impacts without any biases. To grab attention on this seemingly distant and hard to visualize issue, communicators, however, must qualify their temptation to persuade the audience by fear. The image of a polar bear on a melting ice raft made the cover of the *Time Magazine* in 2006, and the message read, "Be worried. Be very worried". However, such grim imagery instead of motivating may turn the audience off. Instead of focusing

excessively on the negative impacts, one may consider suggesting specific actionable measures. One such measure is localizing this 'global crisis' by adequate coverage in local media. Local media can cover environmental issues more widely compared to the national media. When the crisis is viewed as a domestic one, it can be more appealing since an individual's sense of identity is closely tied to a place one lives. Hence building a trusted relationship between scientist and local media can be an effective approach to foster individual engagement and bridge the science-action gap. Communicators should also consider the polarization of beliefs stemming from religious and cultural identity [12]. But under no circumstances, communication should perpetuate misinformation or ignore facts. To better penetrate the public sphere, a domain-specific approach, where a diverse set of experts affiliated to different cultural communities vouching for sound information, can be adopted [13]. The gap between natural scientists, social scientists, and the community, can be further diminished by formulating a new hierarchical structure where scientists are assigned different roles, and they are aware of the nuances of their role. 'Pure scientists' should lay particular emphasis on novel research for advancement of knowledge, 'science arbiters' should focus more towards explaining the pieces of evidence, answering the questions posed by the policymakers and fight misconceptions while 'science communicators' should engage with the society [14]. As climate science extends across various disciplines, such an approach would draw talents from outside the field of climate science. An example of such an initiative is 'Future Earth' (https://futureearth.org/), a global research platform bringing together natural and social sciences; policymakers and stakeholders from outside the scientific community [15].

Disregard for this holistic approach to engage more citizens, political ideology, individualism, and cultural identity play a crucial role and causes people to interpret evidence in a biased way. A study published in 1979 highlights how people tend to interpret evidence in a biased fashion to maintain their initial beliefs [16]. Two groups of people, one supporting capital punishment and the

Biased assimilation of evidence so to fit one's attitude or belief seems to influence our decision-making process and implies that mere availability of contradictory evidence rarely seems enough to cause us to abandon our prior beliefs or theories. Hence, one cannot expect rationality to emerge when furnished with objective truth about burning social issues like climate change.

other opposing it were exposed to two studies. One study seemingly confirmed while the other seemingly disconfirmed their initial beliefs about the deterrent effect of death penalty. Unsurprisingly, subject's decision about whether to accept a study's findings at face value or search for alternative explanations depended on whether the findings agreed with their existing beliefs. This biased assimilation of evidence so to fit one's attitude or belief seems to influence our decision-making process and implies that mere availability of contradictory evidence rarely seems enough to cause us to abandon our prior beliefs or theories. Hence, one cannot expect rationality to emerge when furnished with objective truth about burning social issues like climate change.

In the face of such a complex scenario where people, owing to their individual characteristics, distort their perception towards a given scientific data thus perpetuating polarization, children can influence their parents' attitude towards climate change. Because of the level of trust between parents and children, this form of communication pathway turns out to be very effective in overcoming barriers to climate change concerns [17], thus highlighting the need for an effective climate science education among the adolescents to accelerate the process of inspiring higher levels of concerns among the adults, towards climate change. Teachers and lecturers are often very successful in facilitating climate awareness among young minds. To increase young people's engagement with climate change, the scope of climate-related education can be broadened. To effectively engage in debates about climate change, adolescents need to understand the 'bigger picture' which includes the economics and politics of climate change and develop negotiation, analytic and scientific skills. Hence, it is a matter of great concern when the science teachers who are supposed to be the messengers of climate change to youths are themselves confused and lack understanding of the science thus hindering adequate delivery of information about climate change [18]. Therefore, improving teachers' knowledge is of paramount importance. Introducing high quality and up-to-date teaching materials as a part of classroom teaching in schools, evidence-based

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approach to properly demonstrate learning, interactions with researchers and climate scientists might be handy in climate change education.

Change is difficult, but a change is needed. This is the most urgent of times. Our greatest predicament has already begun to bite us. The fragile balance that makes our planet hospitable has been disturbed, and the effects will be astronomically worse in the future. Different RCP scenarios show that limiting warming to 1.5$^{o}$C already seems unattainable (*Box* 1). Time to make excuses have long gone by, and now it is time to act. We are the first generation to see the adverse effects of climate change, and we might as well be the last generation who can do something about it before it is too late. We often underestimate our personal ability to influence public policy. However, we can overcome this wrong notion by inspiring faith in our abilities, and a step forward is to break the "spiral of silence". A prime example is Greta Thunberg—the 16-year-old Swedish climate activist—whose actions and speeches has not only influenced thousands of school students across the globe to take part in *#FridayforFuture* school strikes but has also pressurised world leaders to address the issue seriously, serves as a shining example of how the agency of young people can bring about a change in the political institution. Our silence in the face of this existential crisis makes it seem like nothing is happening. And when people are not talking about it, politicians are failing to hear it and so is the media. As such, it is an earnest request to the readers of *Resonance* to break the silence and engage in conversation on this subject with friends and families. Let us talk our way into a better tomorrow!

We are the first generation to see the adverse effects of climate change, and we might as well be the last generation who can do something about it before it is too late.

This is our only home. Let us choose today to make a difference.

**Box 1. Representative Concentration Pathways**

Representative Concentration Pathways (RCPs) provide time-dependent projections of atmospheric greenhouse gas (GHG) concentrations. There are four pathways—RCP8.5, RCP6, RCP4.5 and RCP2.6—that has been selected for climate modelling and research (The numbers refer to radiative forcing* for each RCP). It is based on scenarios published in the existing literature and provide a range of emission and concentrations consistent with or 'representative' of the total literature. Scenarios are plausible combinations of conditions that can represent possible future situations and gives us an idea about the consequences of climate change. Producing scenarios requires estimates of future population levels, economic activity, the structure of governance, social values, and patterns of technological change. Based on different scenarios existing in the literature, the range of radiative forcing can span from as low as 2.5 $W/m^2$ to between 8 and 9 $W/m^2$ and higher in the year 2100. Hence, the RCP set covers not only this range but also include intermediate scenarios as most of the scenarios in the literature lead to intermediate forcing levels.

Across all the RCP projections, the global surface temperature and global mean sea level will rise. Oceans, the major sink of $CO_2$ will continue to warm and acidify. The Arctic region will warm more rapidly. The sea-ice coverage of the Arctic will decrease. The frequency of extreme weather events will increase.

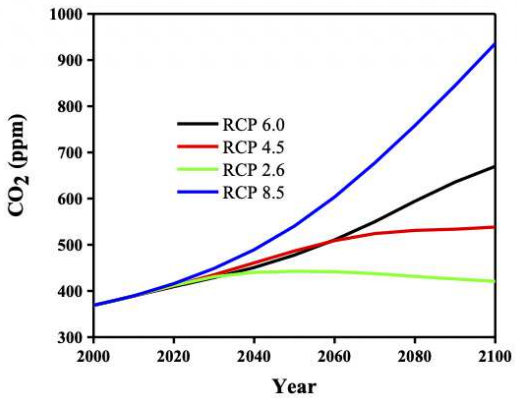


**Figure A**. Atmospheric $CO_2$ concentration in parts-per-million (ppm) according to the four Representative Concentration Pathways (RCPs) used by fifth *IPCC Assessment Report* (Data available form: RCP Database Version 2.0.5).

*Radiative Forcing: It is a measure of Earth's energy budget calculated from the difference between insolation absorbed by the Earth and energy radiated back, reported as watts per square meter. For convenience, 1750 the beginning of Industrial Revolution is chosen as the baseline year and radiative forcing is computed relative to the baseline year. Many different factors like greenhouse gases, aerosols, solar input, and albedo affect this balancing act. However, the uncertainties associated with each of the above-stated variables and the Earth's climatic feedback system like the North Atlantic Oscillation (NAO) and El Nino Southern Oscillation makes the analysis complicated.

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## Further Reading

Interested readers are encouraged to go through the report: A Leiserowitz and J Thaker, G. Feinberg and D. Cooper, *Global Warming's Six Indias*, Yale University, New Haven, CT: Yale

Project on Climate Change Communication, 2013. The study describes a survey of Indians around the country who, based on their opinions, attitude and beliefs on climate change and environmental policies, are segmented into six sub-groups.

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