

WHY THIS READER

Even a few decades ago, I would not have imagined that climate change would be a study subject for graduate and post-graduate students. But today, we have no choice. We must understand the “nature” of the climate change challenge and, most importantly, its politics and science. We have to know, because we have to engage.

Climate change is our inheritance from the 20th century—when the world started its post-industrial revolution and so began the journey with burning fossil fuels for economic growth. But now it is the biggest threat that faces the 21st century—as scientists predict that breaching of the 2°C temperature rise guardrail will bring unimaginable devastation. So, it is your challenge. You will inherit this world, which is already climate-risked and is fast hurtling towards increased temperatures and its predicted consequences.

Therefore, let me say, this *Climate Change Reader for Universities* is not “just-another” textbook—it is, instead, your preparation of how and what must be done to change the present and the future. This learning will equip you—members of the planet with the largest number of young people—on what you stand to inherit and why you must be prepared to change. Many of you were not even born when our atmosphere was filled with unmanageable levels of greenhouse gases by humans and for human wellbeing. But, you are certainly are paying the price for it.

RECORDS ARE TUMBLING

Today, nobody contests that there is evidence of climate change. Nobody contests the inevitability of this crisis. Every year in the 21st century has seen unusual and extreme weather events. It is clear the world's geography is scarily looking similar. Whether you are in the developed part of the world or in India, there is no difference in our experience of extreme weather events. Is this, then, what the future holds for us—a changing weather that knows no boundaries or preferences?

One may ask: how does the world measure the “increased” frequency of extreme weather events? After all, weather is always variable. Meteorological departments across the world keep records of changing weather events and patterns. Their records can point out similar events in the past when there was a similar cloudburst or frost or cyclone or freak snow. How does all this add to climate change? The fact is change will happen in our present and our future. Since the world is only now beginning to see the impacts of rising temperature, data over several years does not exist to

establish a trend in extreme weather events. Science, at best, can use a model to predict impacts of global temperature rise on climate. But today it is clear that the events we are seeing is more than the natural variability of weather.

That's why we are being told by scientists that the difference between weather and climate is a measure of time. Weather is what conditions of the atmosphere are over a short period of time, and climate is how the atmosphere "behaves" over relatively long periods of time. Today, we are seeing the impact of climate change on our weather. It is coming in the form of extreme rain and extreme variations—too cold, too hot or too many tropical storms. All this will only increase in the years to come.

But the question also is that even if extreme events are now being seen and recorded, how does one know this relates to human-made emissions? On this, also science is now equivocal and unanimous—it can track the link between the growth of greenhouse gases that get trapped in the atmosphere and were emitted because of human activity, and the increase in temperature. So, there is no debate on this count. Not anymore.

COMPLICATIONS DURING A CRISIS

But there are complications—we know that multiple factors affect weather and another set of multiple factors affects its severity and impact. In other words, the causes of devastation following extreme events—like droughts or floods—are often complicated and involve mismanagement of resources and poor planning. For instance, we know floods are caused by unusually high rainfall. But it is also clear we have destroyed drainage in floodplains through utter mismanagement. We have built embankments believing we can control the river only to find the protection broken. Worse, we built habitations in floodplains. The devastating recent floods in India—Kashmir, Chennai and Kerala—are stark reminders. This complication hurts people but helps climate deniers. They have a field day saying there is no link between variations in weather and climate change. This book takes you through this politics of climate change; it exposes you to the science of climate change and how it has been abused to deny responsibility for causing it.

We know today the threat of climate change is urgent. We also know combating this threat will require deep and drastic cuts in greenhouse gas emissions. This is when the poor of the world—who are more vulnerable and less able to cope—are already feeling the pain of a changing and more variable climate. The question is why the world continues to look for every excuse not to act, even as science has confirmed and reconfirmed that climate change is real; it is human-made and can devastate the world, as we know it.

The reason is simple: climate change is related to economic growth. In spite of years of protracted negotiations, no country has been able to de-link economic growth from the growth of emissions. No country has shown how to build a low carbon economy, as yet.

The inconvenient truth is not that climate change is real, but that climate change is about sharing that growth between nations and people. There is a stock of greenhouse gases in the atmosphere, built up over centuries in the process of creating nations wealth. This has already made climate unstable. Poorer nations will now add to this stock through their drive for economic growth. But that is not an excuse for rich world not to take on tough and deep binding emission reduction targets. The principle has to be that they must reduce so that we can grow. The challenge is to find low-carbon growth strategies for emerging countries, without compromising on our right to develop.

INTELLECTUAL POVERTY OF SCIENTISTS

As you read this, think how in many ways—climate change science, because of its many variables and very many scenarios—is a game of chess which can only be played by investigative and highly inquisitive minds. The scientist will get clues and the answers will have to be tweaked from scientific evidence, from plain common sense and from what can be observed in the real world.

It is not in the nature of our science to do this kind of imaginative, investigative research. It is certainly not in the manner of our science to draw inferences when there is uncertainty. In the easiest of times, our scientists find it against their nature to cross over the threshold, from what is already established science to what is emerging science. They prefer to play safe with what they know. In the case of climate science, they prefer to be cautious in their words, very conservative in their assessment, and take refuge in the inherent uncertainty of science.

For instance, it will be easy for “safe” science to say that even if glaciers are receding at a rapid pace, it is nothing new or surprising. They are simply passing through a phase of recession as a natural cyclic process. It will also be possible to say (and I have heard this being said very often) that even if we know glaciers are melting, there is no evidence to say that this melt will lead to any significant changes in our hydrological systems. Why? Because our ongoing research does not show anything deviant. It is another matter that the data or method used for the research might be insufficient. Or that the scientist may not have investigated the slim leads that nature was disclosing about herself.

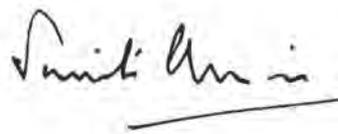
But what is worse is that by the time we know that scientific modellers were right, it just may be too late—glaciers would have indeed melted and we would have a water crisis of huge proportions. So, we cannot wait. This is why we need to understand what science is pointing towards and then start to take action.

In this way, climate science demands new approaches. It demands breaking away from what is already known to discover what needs to be known and how. It requires crossing the line so that inferences can be drawn, however tentative.

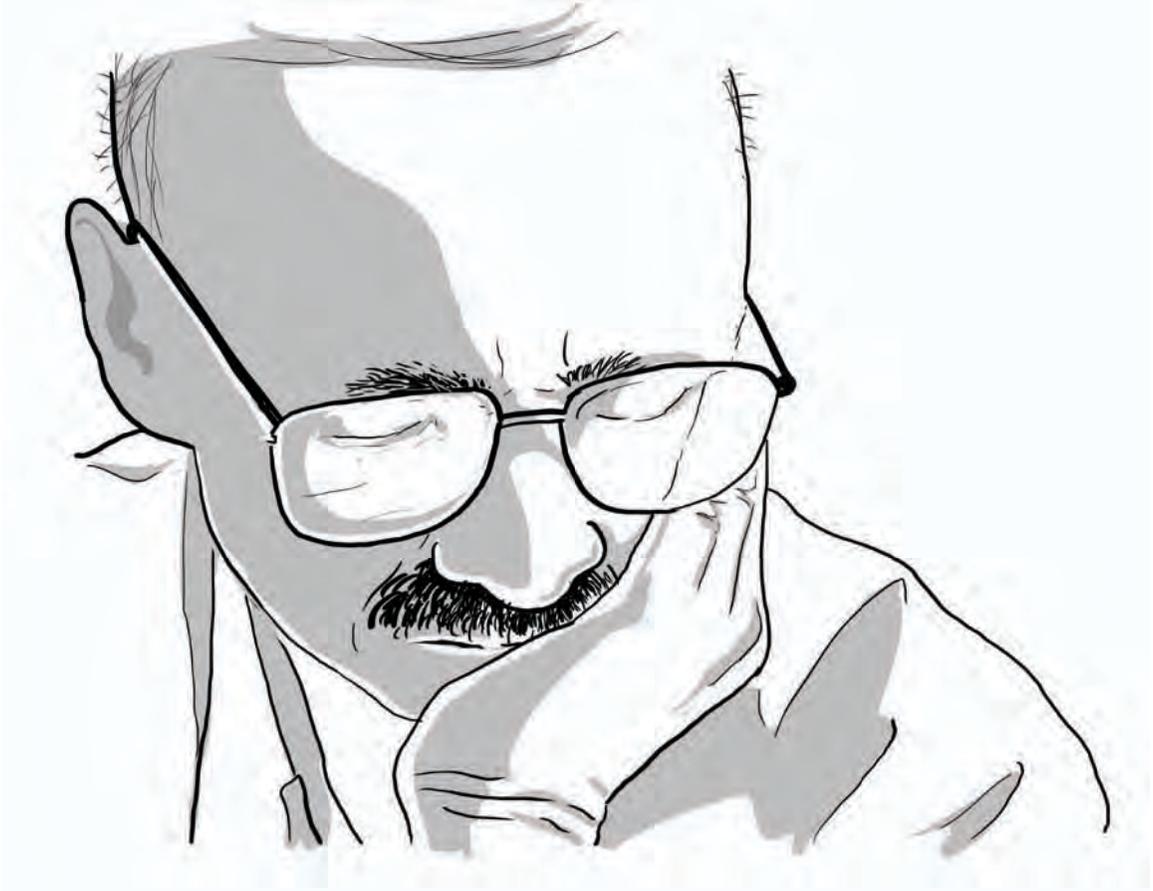
All this works when we begin to learn of the changes even before they happen. This means listening to the people who are first engaged with the ground realities—farmers who work the weather, tribals whose habitat is the forest, fisherfolk who best

know the oceans or pastoralists who understand migration of the seasons. We need to see the changing reality from their eyes. They are also the first victims of climate change—the immorality is that these communities are not responsible for the stock of emissions that are today in the atmosphere and are "forcing" climate change to happen. But they are faced with the first onslaught. This should not be acceptable to us.

What is also clear to me is that the politics and science needed to confront climate change needs to get younger. Why? Because youth has courage. Because youth is not encumbered with the baggage of the past. You can have a new imagination; you can be bold in this view and you have no convention to follow. In fact, you know that the conventions of the past have not worked. If they had, you would not be inheriting a planet hurtling towards catastrophic consequences. So, we need your impatience and your desperation. We need you to teach us now that enough is enough. Change must happen. It can. ■



(Sunita Narain)



ANIL AGARWAL
1947-2002

The critical issue that we are dealing with here is not global warming, but how to manage a global common property resource called the atmosphere. Behind all the global environmental problems that we have been talking about, there are global natural resources which are under threat. When we try to manage any resource, it is important to understand how that resource is being managed, who are the parties responsible for its destruction, and what are the stakes for humanity in that resource. Part of the problem is that the perception of many of these global environmental problems are driven by scientists who understand little about management or about property rights. They focus on technical solutions and insist that those technical solutions be adopted by everybody. Social scientists have paid very little attention, particularly in the developing world, to the management of global environmental resources.

What is being negotiated (in climate forums), therefore, is not how much future emissions should be cut but how we manage the atmosphere and who owns the atmosphere. If the atmosphere is owned by every human being on Earth, then it is now very clear that a few people are using this resource as a free access property and destroying it at the expense of others. Clearly, therefore, a good entitlements regime is necessary to establish everybody's rights in this common heritage of humankind.

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