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View Point

Climate and humanity ☆

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Dealing with the subject of climate change and humanity would require focusing on the earth as a whole. Today there is no corner of this planet that does not have some linkage with human actions and their nexus with climate change either directly or indirectly. As we find stronger and more convincing information on human interference with the world's climate system, we can say that every form of life on this planet is perhaps being subjected to the impacts of human action through changes in climate. In the context of climate change, however, it may be relevant to ask three questions.

1. What is the manner in which human actions have influenced this planet's climate system?
2. What are the impacts of climate change, and can we identify what types and levels of impacts are directly attributable to human actions?
3. What can the human race do to mitigate the problem both in terms of managing the causes leading to climate change and adapting to that extent of climate change, which appears inevitable now and likely tomorrow?

These are questions that the IPCC has been attempting to answer since this body was established in 1988. Indeed, through the mobilization of rich talent from all over the world the IPCC has been able to provide the very best and the most credible answers that are possible with advances in knowledge that are taking place in this field on a regular basis. Observations that have been made both directly and through a range of reliable techniques for indirect measurements clearly establish that the earth's climate is changing. This is on account of natural factors as well as human induced causes. Our knowledge and our abilities in modeling climate change have increased to a level where we are able to separate out with high degree of precision changes in climate on account of natural as well as anthropogenic forcing. The work of the IPCC in every successive report has provided growing evidence on the effect of human activity on climate change.

Overall, the challenge of climate change facing the world convinces us that never before has there been a greater need for science to dictate directions and priorities in policy and perhaps never before has there been a greater need for policymakers to direct priorities in scientific inquiry. There is no doubt that the work of the IPCC has provided a strong scientific basis for understanding the complexities of climate change in various parts of the world. It is also perhaps true that the occurrence of several extreme weather events that have taken place recently have brought into existence the growing public view that something is changing in the climate which human actions are responsible for. It hardly needs to be emphasized that the climate of the world is a vital natural resource. Human activities that are the very backbone of our economic existence and a major basis for the well being of the human race are delicately connected with the state and stability of the climate in different parts of the globe. With heightened understanding of the impacts of climate change, there is reason to be concerned that the most underprivileged human beings are likely to be perhaps the worst affected. The Third Assessment Report (TAR) of the IPCC clearly stated that:

> The impacts of climate change will fall disproportionately upon developing countries and the poor persons within all countries, thereby exacerbate inequities in health status and access to adequate food, clean water and other resources.

The human concern for welfare of the poorest communities in the world should also emanate from a specific definition of poverty, which according to Prof. Amartya Sen, the Nobel laureate in economics is best described in his words:

> Poverty is deprivation of basic capabilities, rather than merely low income, which can be reflected in premature mortality, significant undernourishment (especially of children), persistent morbidity, widespread illiteracy, and other failures.

☆ Chair, IPCC WG2 Extract from a speech to the World Conference on Climate Change, Moscow, September 2003.

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All of these conditions would be accentuated by the impacts of climate change. Of course, those who have limited incomes and wealth also, almost by definition, have limited opportunities for creating new choices, but the impacts of climate change result in a further narrowing even of these existing choices. The livelihood of the poor depends inextricably on the existence of healthy natural resources and an unpolluted environment. If climate change has an adverse impact on the fertility of soil and the availability of water, then such an impact will be felt adversely on the life support systems on which the existence of the poor depends completely. A large part of agriculture in the developing world depends on precipitation, any adverse change in which would affect global food security and the stability of the social order in societies that survive on subsistence levels below the poverty line. The Third Assessment Report (TAR) provided us with an assessment of the potential for food crisis in different regions of the world. According to this estimate in particular the people living in India and China would become highly vulnerable by the year 2050.

Coincidentally, the regions which would be particularly vulnerable to the threats of sea level rise also overlap with those very areas which are susceptible to decline in agriculture. For instance, sea level rise by the year 2050 could pose a risk to 26 million people in Bangladesh, 12 million in Egypt, 73 million in China and 20 million in India. Globally upto 200 million people are likely to be at risk on account of sea level rise (IPCC, 2001) [IPCC Synthesis Report, 2001].

Developing countries also lack infrastructure in financial services, such as insurance and credit facilities. These only add to the vulnerability of the poor who cannot receive any relief in the event of climate related impacts which may have negative consequences on their lives.

The connection between extreme events and human-induced climate change needs further investigation and rigorous scientific research. However, it is now becoming increasingly clear that the transition from one equilibrium condition to another may not be smooth. The sensitivity of systems to climate change may be nonlinear, complex and completely discontinuous. This could lead to very rapid, large magnitude and unexpected impacts on local, regional and global scales. Even more serious is the fact that the impact could lag the trigger by decades to even a century. Instances of singular events that could occur with very serious consequences are:

- breakdown of the thermohaline circulation,
- disintegration of the West Antarctic ice sheet,
- shift in mean climate towards an El Nino like state,
- runaway carbon dynamics—reduced sink capacity, methane emissions from hydrates,
- rearrangement of biome distribution.

While adaptation is going to be critical to the ability of human communities to counter the impacts of climate change, the nature of adaptation measures would also require change over time. For instance, if we take the case of agriculture, in the short-run relief could be found in better management of available water supply, better agricultural practices and the use of species that have higher levels of drought and salt tolerance. In the longer term, the threat of growing scarcity of water and greater intrusion of salinity in ground water onshore, would require the development of strains that are resistant to both salinity and water stress. The long-term nature of the impacts of climate change requires adaptation to be accepted as an immediate imperative. Irrespective of whatever actions are taken today to reduce the emissions of greenhouse gases, the inertia in the system will bring about changes in the climate for decades and perhaps centuries. Sea level rise will continue even longer.

While looking at the linkages between climate change and the human condition, perhaps the most profound realization of responsibility that human society needs to reach is provided by a simple statement from the IPCC TAR.

"There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities." Conceivably, the same could be said on the basis of current trends about the next 50 years also.

But this realization needs to be spread across communities, rich and poor, through a concerted effort at dissemination of the basic messages provided successively by assessments produced by the IPCC.

As we progress with the work of producing the Fourth Assessment Report (AR4) an important objective to be addressed would be that of extensive dissemination of information from this assessment to society at large. The very nature of climate change is such that its influence and impact has to be seen from the perspective of the most underprivileged and dispossessed of human beings. Should they, therefore, not be the recipients of the message we are creating? Mahatma Gandhi's exhortation to view every action in terms of what its impact would be on the most underprivileged or as he called it 'Antyoday', which essentially means taking care of the welfare or enlightenment of the last or the most marginalized individual, becomes paramount. The principle of ensuring equity in climate-related decisions has been emphasized in all the three assessment reports of the IPCC, and indeed this issue would need to be addressed robustly in scientific terms in the AR4 as well. An extreme example of the inequitable impacts of climate change and the responsibility for causing climate change is provided by the situation of small island states in different parts of the world. The TAR states that "although the contribution of small

island states to global emissions of GHGs is insignificant, projected impacts of climate change and sea level rise on these states are likely to be serious.'' It also explains that the impacts will be felt for many generations because of the low adaptive capacity of these states, their high sensitivity to external shocks and high vulnerability to natural disasters. It concludes that adaptation to these changing conditions will be extremely difficult for most small island states to accomplish in a sustainable manner.

There is today a debate arising out of Article 2 of the Framework Convention on Climate Change on what would constitute a level of concentration of greenhouse gases in the earth's atmosphere, which could be treated as dangerous. That is an issue which goes beyond the realm of science, and its definition has to be determined by political leaders and those responsible for decisions on the future of human society. Scientific assessments as published by the IPCC clearly provide evidence of the threats to small island states, to impoverished communities all over the world and to those dependent on scarce water supplies, which are dwindling further under the impacts of climate change. Scientifically the message contained in previous assessments of the IPCC has effectively dealt with the question of what is dangerous, and perhaps very little more can be done on a scientific basis to elaborate on this issue. But this will remain a subject for debate over many years in the future.

Human society has shown remarkable enlightenment in taking actions in the face of several such challenges in the past. For some years now analysts have been studying the effectiveness of multilateral agreements arrived at in recent decades and their implementation. An example often quoted is that of the Montreal Protocol, which has been a success story, and one that was driven by scientific facts and their logical appeal for the public in many countries. Even though the Montreal Protocol was addressing a problem which represented a mere fraction of the complexities embedded in the climate change problem, it does represent an example of multilaterally coordinated action towards achieving a goal set by scientific assessment. Concerted action by human society to eliminate continuation of firmly established practice from the past is not new, and goes back at least 40 years in the case of environmental action. When Rachel Carson published her book ''Silent Spring'', she was fighting against a strong mindset that saw DDT, the most powerful pesticide the world had known, being attacked as a major threat to human health. A senior executive of a company manufacturing insecticides actually stated:

> If man were to faithfully follow the teachings of Miss Carson, we would return to the Dark Ages, and the insects and diseases and vermin would once again inherit the earth.

We find several similar statements being made on measures required to mitigate the emissions of greenhouse gases. And yet every assessment of the IPCC has shown enormous benefits globally from tackling the threat of climate change and the modest cost incurred in doing so. The Second Assessment Report (SAR) of the IPCC stated:

> Many nations face lost capital value in excess of 10% of their gross domestic product (GDP). Although annual protection costs for many nations are relatively modest (about 0.1% of GDP), the average annual costs to many small island states total several percent of GDP. For some island nations, the high cost of providing storm surge protection would make it essentially infeasible, especially given the limited availability of capital for investment.

In the TAR estimates of loss of global average GDP reduction in the year 2050 for different levels of stabilization of CO_2 ranged from a little over 4% for 450 ppm to around 1.5% for 650 ppm (IPCC Synthesis Report, 2001).

In democratic societies it is essential that the will of the people translates into resolve at the political level. Where change is required from the traditional path of development, driven by knowledge of an undesirable destiny or destination, then it is necessary for people to be provided with access to such knowledge. The IPCC, therefore, has to seek partnership from those who can disseminate the message that has come out so far and that is expected to be produced from the Fourth Assessment Report.

I would like to compliment the organizers of the WCCC 2003 for putting together a group of citizens from all over the world who can make a difference. This conference will undoubtedly inform and equip them with knowledge of all aspects of climate change. We hope that these conferences on climate change become an annual feature in different parts of the world, and perhaps the Russian Federation should request the United Nations to declare September 29 as World Climate Change day to commemorate and reinforce the value of the initiative that has been taken today.

References

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