# THE CHANGING PATTERNS OF GLOBAL CLIMATE CHANGE ARCHITECTURE

**DHANASREE JAYARAM**

"It is the responsibility of each human being today to choose between the force of darkness and the force of light. We must, therefore, transform our attitudes, and adopt a renewed respect for the superior laws of DIVINE NATURE."[1] These words of Maurice Strong, former Secretary General of the United Nations Environment Programme (UNEP) at the 1992 Earth Summit sparked off a fresh debate that forced the international polity out of slumber. If the 20th century was marred by World Wars and other conflicts that took a toll of millions of lives, the 21st century is turning out to be the century of environmental wrath that could take even more lives than any form of conflict. The human-induced process of environment change that was set off in the 20th century by the industrialisation drive of the developed countries is gradually worsening as the international community awaits a consensual deal. One could say that it is not the definition of climate change that needs to be looked into; it is the definition of 'response to climate change' that needs to be transformed so that the 'measures' bear fruit.

* **Ms Dhanasree Jayaram** is a Research Associate at the Centre of Air Power Studies, New Delhi

1. Maurice Strong, Opening Speech of 1992 Rio Earth Summit, Policy (Science and Public Policy Institute: March 10, 2008), see http://scienceandpublicpolicy.org/policy.html, accessed on June 10, 2011.

**India is one of the most vulnerable countries in the world not only due to its geographical conditions but also its weak infrastructure.**

Geo-politically, climate change is an issue that encompasses all facets of international politics that steer a nation's march towards achieving national comprehensive power. Ironically, the international negotiations themselves have become synonymous with 'conflict' rather than 'cooperation.' Resolution of the geo-political chaos is the key to effective tackling of the effects of climate change. To be more futuristic and perhaps idealistic, the negation of the geo-political chaos and the introduction of an alternative such as technology cutting across political fault-lines should be given due attention. The first step towards that would be restandardisation of international relations that would create political willingness.

India is one of the most vulnerable countries in the world, not only due to its geographical conditions but also its weak infrastructure. At the international level, as an important participant on the negotiating table, India has come a long way from being a silent spectator to being a leading voice from the developing world. However, the road ahead seems challenging as in an increasingly competitive world, with wealth comes power, with power comes responsibility and with responsibility comes liability. At the national and local levels, the country needs to examine the methodology of adopting a robust climate change policy that simultaneously deals with three issues — energy management, development and reduction in emissions of pollutants and Greenhouse Gases (GHG) — since it is grappling with poverty and an energy deficit. The presence of extreme poles in this country that are being dictated by the differing stances of the political class, the judiciary as well as the activists, forms the core of the debate. The constant tussle between the government and the activists in terms of environmental governance has always been in the limelight. While the government has to fulfil the short-term goals shaped by vote-bank politics which could be at odds with environment protection, the activists want to embark on a system-overhaul process which could give rise to an eco-conscious society, encouraging only environment-friendly policies, compromising development. The judiciary

plays a critical role as a check on the government and the industry, yet the loopholes have rendered 'environmental justice' flawed in many cases. As part of an India-centric evaluation of the impact of climate change, this paper would also delve into the intricacies of national security that could be threatened in various ways. As the world gears up to deal with the vagaries of climate change – the crux of environment change – both the theory and practice of politics of climate change would be revisited in the subsequent pages. This could map out the steps that could tighten up global efforts in the areas of adaptation and mitigation. These physical and metaphysical issues are hard to disentangle like the Hegelian dialectic but an effort would be made to reach a 'synthesis' through analysis and case studies. The first and foremost task is to understand climate change as it is and as it is perceived through the prism of international relations.

## REDEFINING CLIMATE CHANGE

### *A Multifaceted Phenomenon*

Climate change is a dynamic phenomenon that has multiple layers. To classify it as merely scientific or meteorological will be too simplistic. In today's world, every issue develops tentacles that reach out to various spheres, usually guided by conflicting ideologies. This is the reason why definitions have become transient and relative. Though climate change is incontrovertibly a global phenomenon that has universal causes and consequences proven by the scientific community time and again, it affects different entities or spheres differently, making the task of framing the exact definition highly contentious. In geo-politics, this becomes even more complicated since the world is clearly divided into nation-states with lucidly delineated boundaries and cogently defined national interests.

On the one hand, the international community represented by various organisations has come up with definitions that have got acceptance worldwide. But one has to take into account the politics of climate change which guides the fundamental theories related to it; the former has assumed significance to such an extent that the real dangers of climate change

are being overlooked. The starting point of the differences between the perspectives of the scientific and the political communities is the definition itself exemplified by the Inter-governmental Panel on Climate Change (IPCC) and the United Nations Framework Convention on Climate Change (UNFCCC) respectively. The latter defines 'climate change' as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods."[2] The former states, "Climate change refers to a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use."[3] While the UNFCCC specifically focusses on climate change attributable to human activities for obvious reasons, the IPCC looks at it more holistically by making a distinction between 'climate change' that is triggered by human activities and 'climate variability' that is ascribed to natural causes. It is the human activities that have divided the world into several blocs and the definitions yet again vary from bloc to bloc since the degree of impact and the urgency of response to climate change are variable.

***Geo-politics and International Relations Approach***

The geo-politicians draw conclusions based on these diverse perspectives of climate change and, thus, expand the definition to include the facet of international security. According to them, it is the architect of the process of redrawing the world map, besides being the platform for the 'clash of interests' between nation-states. In international relations and world politics, the environment has always been one of the top priorities and with the advent of the concept of climate change, it has assumed even

2. The United Nations Framework Convention on Climate Change, Article 1 (for the purposes of this Convention), Paragraph 2, see http://unfccc.int/essential_background/convention/background/items/2536.php, accessed on March 18, 2011.
3. IPCC Working Group I: The Scientific Basis, Appendix I – Glossary, see http://www.ipcc.ch/ipccreports/tar/wg1/518.htm, accessed on March 18, 2011.

more significance. The blame-game over the origin of climate change and the debate over the possible measures to tackle it have turned it into a playground of power politics. Just as it has divided nation-states, it has also divided the international theorists. The debate between the 'modernists' and the 'ecoradicals' is the most noteworthy one. The former group is of the belief that environmental protection cannot be achieved at the expense of development. Thus, they champion the cause of environmental protection and promotion of the development agenda concurrently. This model essentially lays emphasis on the upgradation of the existing scientific and technological resources that could mitigate environmental degradation. However, these environment-friendly techniques have been rejected by the 'ecoradicals' according to whom the only way to decelerate the dramatic rise in pollution and exhaustion of natural resources is to halt the process of growth itself. This was also the central finding of a group of scholars of the Club of Rome who published "Limits of Growth" in 1972. They strongly believe that progress in science and technology cannot solve the problems that the entire humanity will face since the ecosystem does not have the capacity to withstand 'human atrocities' beyond a certain point. They call for a complete overhaul of human nature, lifestyle and population control measures.[4] These two theories are two sides of the same coin. The first one accepts the reality of the current economic growth model that is central to any country's comprehensive power theory but it fails to make an assessment of the notion of development. Though it promises to provide long-term solutions, it fails to gauge the status of the environment in the long run. The second one takes a more idealistic stand that regards the whole world as one organism and that destruction of one part would result in the destruction of the entire planet. It completely excludes the needs of a growing as well as demanding population. Though it has a long-term perspective, it fails to give an alternative to the current economic model apart from demanding decentralisation, devolution and diffusion of powers of the nation-state in order to generate 'ecocentric' communities. New environmentalism

4. Robert H. Jackson and Georg Sørensen, *Introduction to International Relations: Theories and Approaches* ( UK: Oxford University Press, 2007), pp. 261-263.

**New environmentalism is deemed an offshoot of the emerging threats of global warming and climate change.**

is deemed an offshoot of the emerging threats of global warming and climate change. The theory of new environmentalism recognises the fact that global warming is a symptom and not a problem; and the problem lies in the wasteful and exploitative nature of human society. It also takes into account the energy stress along with energy security which is closely linked to climate change.

It must also be noted that climate change, like any other environmental problem, could lead to both conflict and cooperation — epitomised by the realists and the liberalists respectively. This is the reason why while talking about environmental degradation or climate change, it is equally important to analyse the environment from the perspective of the state. States evolve their environmental policies according to their national interests — immediate, concrete, abstract or distant. Despite the fact that global warming and climate change affect all humanity and not just one state or a few states, they are likely to be categorised under the 'environment which is owned by none' since they force the international community to cooperate, based on national interest. This is proved by the 'failure' of the Kyoto Protocol which entered into force in 2005 due to the overpowering of the overall interests of the world by the states' interests.

The phenomena of global warming and climate change also challenge the concept of sovereignty. While state sovereignty continues to be the most decisive factor in international politics, the environment debunks state sovereignty to a certain extent. The environment cannot be divided into territories. At the same time, every state has the right to exploit its territorial natural resources as well as a moral (or even, to some extent, legal) obligation to protect the environment that belongs to the whole world, that which is not restricted to a particular territorial space. Therefore, the states' sovereignty "allows them to use, but not to abuse, pollute, exploit or otherwise overuse the environment."[5] Environmental governance and territorial sovereignty

5. Klaus Bosselmann, "The Earth Charter and Global Environmental Governance," in R. K Gupta, Klaus Bosselmann and Prasenjit Maiti, eds, *Global Environment: Problems and Policies* (New Delhi: Atlantic Publishers & Distributors (P) Ltd:, 2008), Vol. 2, p. 78.

are interlinked. That is why, to date, the developed and the developing countries have not been able to reach a consensus on the issue of 'climate justice.' On the one hand, the developed countries insist that every country, including the ones belonging to the developing world, should take up the burden of fixed emission cuts. On the other, the developing countries continue to raise the issue of their rights to achieve development which the developed countries have already achieved in the process of which they contributed most to the GHG emissions.

**The developed countries insist that every country, including the ones belonging to the developing world, should take up the burden of fixed emission cuts.**

***Science Matters***

A clear understanding of the theories associated with climate change should be backed by scientific and experiential facts. It is a well-known fact by now that the root cause of climate change is 'greenhouse effect.' This is the primary factor that contributes to the sustenance of life on earth as it keeps the temperature of the earth sufficiently high. But the same effect could prove disastrous if it is intensified by carbon emissions due to burning of fossil fuels and deforestation. Methane emissions caused by agricultural activities are also said to be significant contributors although this has become a major bone of contention between the developed and the developing countries. The primary greenhouse gases include carbon dioxide ($CO_2$), methane ($CH_4$), nitrous oxide and halocarbons, out of which $CO_2$ is the biggest contributor. Human activities as a source of climate change have been highlighted by the IPCC in their Assessment Reports, and in the Fourth Assessment Report (2007) they reiterated that "Global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70 percent between 1970 and 2004." They went one step ahead to increase the probability to more than 90 percent, that reinforces the chief cause of the increased greenhouse effect to be human

activities.[6] The natural process by which the carbon is released into the atmosphere is accelerated by the activities of human beings. This causes global warming, which, in turn, sets off radical variations in the weather including precipitation, winds, temperature, and so on. For example, an increased concentration of $CO_2$ in the atmosphere is known to affect the cloud cover. Over the years, the sceptics have discarded the findings of the scientists sporadically and come up with their own conclusions that consider climate change a natural phenomenon or attribute it to other sources such as cosmic rays that affect the formation of clouds. A case in point is the reduction in solar activity, which is regarded by a majority of climate scientists as the cause of the Little Ice Age during 1650-1850. One of the National and Aeronautics Space Administration (NASA) studies has refuted this claim by stressing on the facts that the average amount of energy emitted by the sun has not reduced or increased drastically since 1750 and that only the lower parts of the atmosphere have become warmer while the upper atmosphere is cool as the GHGs trap heat in the former.[7] Since the politics of climate change revolves around the assumption that human activities are the dominant contributor, climate scepticism loses relevance in this context to a certain extent.

## IMPACT OF CLIMATE CHANGE: AN INDIAN PERSPECTIVE

### *Facts and Figures as Seen Through the Indian Eyes*

Climate change could have unprecedented environmental, social and economic consequences, which, in turn, hold the potential to create a shift in the relations between different nation-states, eventually to culminate in an environmental or political semi-apocalypse. Bill Clinton very famously said, "First, I worry about climate change. It's the only thing that I believe

6. IPCC Fourth Assessment Report, Summary for Policymakers, in *Climate Change 2007: Synthesis Report*, approved in detail at IPCC Plenary XXVII (Valencia, Spain, November 12-17, 2007), p. 5, see http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf, accessed on June 13, 2011.
7. "Causes: A Blanket Around the Sun," *Global Climate Change: Vital Signs of the Planet*, National Aeronautics and Space Administration, see http://climate.nasa.gov/causes8/, accessed on June 12, 2011.

has the power to fundamentally end the march of civilization as we know it, and make a lot of the other efforts that we're making irrelevant and impossible."[8] The real signs of a changing climate are manifested by sea level rise, global temperature rise, shrinking ice sheets, glacial retreat, extreme weather events, and so on. Some of the figures released by NASA are grim reminders of what is in store for humankind if immediate measures are not taken to mitigate climate change. For instance, the $CO_2$ concentrations are at their highest in 650,000 years. The global average sea level has risen by 4-8 inches over the past century and it is increasing at the rate of 3.27 mm per year. There has been an average increase of 1.5°F in the global temperature since 1880. Besides the doubling of the loss of Greenland Ice between 1996 and 2005, January 2000 to December 2009 was recorded as the warmest decade.[9] The Indian scientists have also added more credence to these findings as evidenced by the reports of the Indian Space Research Organisation (ISRO) that concluded that the Himalayan glaciers have retreated by nearly 16 percent in the last five decades. Their study on the impact of climate change on agricultural yield and hydrology also revealed disturbing results. In the case of the former, it is in the form of reduction in the output of wheat, rice, maize and pearl millet, while in the case of the latter, it is in the form of increase of runoff in almost all the major river basins of India in the month of June. The 2009-10 report of the ISRO also said that the Indian livestock is a major source of $CH_4$ emissions.[10] A rise in temperature in the Tibetan plateau could reshape the subcontinental river systems, especially that of the Brahmaputra and the Indus and convert them into monsoon-fed rivers

**The real signs of a changing climate are manifested by sea level rise, global temperature rise, shrinking ice sheets, glacial retreat, extreme weather events, and so on.**

8. See, Dan Perry, "Clinton: Climate Change is the World's Biggest Worry," http://www.newsday.com/news/local/wire/newyork/ny-bc-ny--worldforum-clinto0128jan28,0,379601.story?coll=ny-region-apnewyork, accessed on February 24 , 2011.
9. "Global Climate Change: Vital Signs of the Planet," National Aeronautics and Space Administration, see http://climate.nasa.gov/, accessed on June 12 , 2011.
10. "Himalayan Glaciers Retreated by 16% in Nearly Five Decades: ISRO," *Daily News & Analysis* (Bangalore), March 27, 2010, see http://www.dnaindia.com/india/report_himalayan-glaciers-retreated-by-16pct-in-nearly-5-decades-isro_1364163, accessed on June 16, 2011.

that could annihilate a significant proportion of the population in South Asia, including India.

***Indications: India and the World***

Scientific evidence shows that climate change leads to higher frequency of extreme weather events such as heat waves, heavy precipitation events, floods, droughts, fires, severe cyclonic storms, which, in turn, result in a surge in deaths, injuries, toxic contamination, infectious diseases, social disruption, environmentally forced migration, and the list goes on. A simple illustration would be the implications of higher temperatures; they could heighten both flood and drought risks, the former due to a sustained increase in the precipitation and the latter due to increase in evaporation. There are countless indications which cannot be thwarted by the sceptics. Some of these are the unusual heat waves in North America, Russia and Europe; the unpredictable precipitation episodes in Latin America and South Asia; hurricanes in the US; cyclones in the Indian Ocean region; droughts and desertification in Africa, West Asia and North Asia. As far as India is concerned, the Global Climate Risk Index 2010 released in Copenhagen revealed that the country has witnessed 325 extreme weather events in the last 18 years in which 3,255 people have died annually.[11] One could easily conclude that although sceptics have raised doubts over the cause of intense and more frequent El Nino and La Nina events, they could easily be considered the signs of a larger catastrophe that climate change could unleash in the future. Moreover, the IPCC states, "Taken as a whole, the range of published evidence indicates that the net damage costs of climate change are likely to be significant and to increase over time."[12]

11. Sven Harmeling, "Global Climate Risk Index 2010: Who is Most Vulnerable? Weather-Related Loss Events Since 1990 And How Copenhagen Needs to Respond," *Germanwatch* (Berlin), December 2009, p. 11, see http://www.germanwatch.org/klima/cri2010.pdf, accessed on June 16, 2011.

12 IPCC Fourth Assessment Report, Summary for Policymakers, in *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* ( Cambridge, UK: Cambridge University Press, 2007), p. 17, see http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg2_report_impacts_adaptation_and_vulnerability.htm, accessed on June 15, 2011.

The rise in global sea levels caused by the melting of polar ice caps and glaciers is expected to result in the submergence of low-lying areas, including river deltas, coastlines and small islands. To mention a few examples, the IPCC has predicted that if the sea level rise exceeds 2 metres, nearly 50 percent of Maldives would be inundated and in the case of Bangladesh, a 1.5 metre rise would submerge 15 percent of all the land area and about 20 percent of the farmland, with 20 percent less agricultural production, and would displace about 20 percent of the nation's total population.[13] It is expected to have an adverse impact along 7,000 sq km of the Indian coastline. A one metre sea level rise would lead to the displacement of nearly 40 million people in India.[14] Interestingly, the rising sea water has ended the dispute between India and Bangladesh over the New Moore Island by engulfing it in 2010. Massive displacements were caused by the sinking of two other islands in the Sunderbans – Lohachara and Ghoramara. The changing patterns of salinity caused by climate change have affected not only the mangroves but also fishing, leading to the disappearance of one of the mangrove species called Sundari trees, and economic enslavement of the fisherfolk. Besides, an increase in the global temperature could affect the ecosystem, which would disrupt habitats such as coral reefs and alpine meadows, which, in turn, would lead to the extinction of several plant and animal species. The dwindling number of Bengal tigers has been attributed to the rising sea levels as their migration to the higher ground would be prevented by human habitation in the adjoining lands. The effects of climate change on the society and the economy are, therefore, expected to be severe. If one takes into account "the cost to agriculture, forestry,

**The rise in global sea levels caused by the melting of polar ice caps and glaciers is expected to result in the submergence of low-lying areas, including river deltas, coastlines and small islands.**

13. R. K. Gupta, "Global Warming and its Effects," in Gupta, et al, eds., n. 5, Vol 5, pp. 56-60.
14. Alex de Sherbinin, Koko Warner and Charles Ehrhart, "Casualties of Climate Change: Sea-Level Rises Could Displace Tens of Millions," *Scientific American*, January 10, 2011, see http://www.scientificamerican.com/article.cfm?id=casualties-of-climate-change, accessed on June 18, 2011.

**The development versus environment debate has ensured that India's policies towards achieving a low-carbon economy and sustainable development remain in limbo.**

water supply, fisheries, infrastructure, energy, hurricane damage, drought damage, land loss, loss of wetlands, loss of forest, loss of human life, loss of species as well as pollution and migration, the total annual cost of all the aforesaid global warming effects is estimated to average 1.5-2% of the current global GDP, that is, between 480 and 640 billion dollars."[15]

***Climate Change and National Security: Indian Viewpoint***

The interconnectedness between climate change and national security has been a source of debate for the policy-makers across the globe. It is preposterous to dissociate national security from human security. If the population of a nation-state is not socially, economically, politically and psychologically secure, national security of that particular nation-state would remain incomplete. National security encompasses not only military strength but also social security, environmental security, energy security, economic security and a wide range of aspects that impinge on human security in general. After all, the nation-state is just a conglomerate of its inhabitants at the atomic level. Yet the policy-makers have been trying to downplay the threat that climate change poses to national security especially in a country like India. This is the reason why attempts have been made by the research community to link up the two so that the issue of climate change is taken as seriously as the menace of terrorism. In India's context, there are various issues that imperil our national security but very often they are straight-jacketed into our neighbours on the west and the north.

Besides, the pulls and pushes in the country that emanate from the different entities, including the government, industry, judiciary and environmentalists, have also led to myriad contradictions at the policy-making level. The development versus environment debate has ensured that India's policies towards achieving a low-carbon economy and sustainable

15. Gupta, n. 13, p. 63.

development remain in limbo. This debate dates back to the days of Indira Gandhi's reign; when India was asked by Ronald Reagan in the early 1980s to "pull up its boots," Mrs. Gandhi retorted that India was not in a position to pull up its boots as Indians did not have boots.[16] As a case in point, nearly 400 million Indians are reported to be without electricity.[17] The unpredictability of costs and trade-offs when it comes to transition to a 'green economy' in the light of the growing population and its energy needs, along with the teeming poverty, needs to be settled. The international pressure to adopt binding emission cuts, on the one hand, and the domestic requirement of energy, on the other, have led to sharp divisions within the country. Securitisation of the debate is more or less a taboo as evinced by one of the premier environment journalists in the country, according to whom 'playing the waiting game' is going to be the strategy of a majority of the nation-states, including India. Similar indications have been made by the country's policy-makers too, according to whom, the connection between climate change and national security is not direct and the question of sacrificing the present for the future is unthinkable as far as sustainable development is concerned. The National Action Plan on Climate Change, approved by the Prime Minister on June 30, 2008, is the core of India's climate change policy. Under its umbrella, the Government of India has undertaken a series of actions to mainstream climate change in sustainable development. Yet the debate continues as the Minister of Environment and Forests, Jairam Ramesh confessed in public that he was under pressure to be more flexible with granting environmental clearances to different projects that have been found to be violating environmental norms.[18] This could be the perfect explanation for the Indian polity's reluctance to invest in renewable technology in a full-fledged manner as compared to other countries in the

16. Discussion with Air Cmde Jasjit Singh AVSM VrC VM (Retd), Centre for Air Power Studies, on July 6, 2011.
17. See Jeremy Page, "India Looks to the Sun for Ambitious Surge in Green Power," *The Times* August 3, 2009, http://www.timesonline.co.uk/tol/news/world/asia/article6736726.ece, accessed on June 15 , 2011.
18. See Sangeeth Sebastian, "I Have Been Under Pressure to Overlook Environment Violations: Jairam Ramesh," *India Today,* May 7, 2011), http://indiatoday.intoday.in/site/story/jairam-ramesh-violated-environment-rules-under-pressure/1/137396.html, accessed on June 19, 2011.

**Climate change has the potential to add a whole new dimension to India's disputes with its neighbours.**

West and even China. The international community has so far not shown the keenness to go beyond the ambit of 'short-term solutions' and 'low-hanging fruits.'

Climate change has the potential to add a whole new dimension to India's disputes with its neighbours. The first and foremost issue that comes to the mind of every Indian in this context is the Kashmir dispute. The world's highest battlefield, the Siachen glacier, is said to have receded by nearly 800 metres in the past 20 years due to climate change. It has been found that the military presence in the region has resulted not only in the deterioration of the ecosystems but also the pollution of the Indus river. Interestingly, Pervez Musharraf, former President of Pakistan, claimed in his dissertation that the Kashmir dispute was primarily based on the distribution of the Indus river waters between India and Pakistan. Stressing on the fair distribution of waters, he asserts, "If one were resolved, the other would not exist."[19] It is highly possible that if the Indus river dries up due to global warming, a water-deficient Pakistan might resort to a full-fledged war with India over the distribution of its waters. Pakistan has already made it clear that it would not hesitate to use its nuclear weapons against India if the latter chokes the water supply to its territory, as confirmed by a report prepared by nuclear physicists Paolo Cotta-Ramusino and Maurizio Martellini of Landau Network, Italy, on Pakistan's nuclear policy in which they quote Lt Gen Khalid Kidwai (Retd), the Director-General of the Strategic Plans Division of Pakistan.[20]

The threats of water wars or a World War III due to water scarcity are palpable for not only India and Pakistan, but the entire world. Water wars in the Middle East/West Asia due to scarcity of water, particularly between Israel and Palestine, are quite well-known. If the trends of drought, famine

19. Nitin Pai, "Climate Change and National Security: Preparing India for New Conflict Scenarios," *Pragati - The Indian National Interest Review* (New Delhi) April 2008, n. 1, p. 2, see http://nationalinterest.in/wp-content/uploads/2008/04/inipolicybrief-no1-climatechangeandnationalsecurity-nitinpai-april2008.pdf, accessed on February 10, 2011
20. See. Nadeem Iqbal, "Economic Threat may Push Pakistan to go Nuclear," *Asia Times* (February 6, 2002, http://www.atimes.com/ind-pak/DB06Df02.html, accessed on June 13, 2011.

and disease continue, the chances of population shifts and political turmoil would increase further in this region. Since economic, energy and climate challenges are closely interlinked, the security implications are graver. Countries with fragile governments could become failed states. Some of the countries in Africa are deeply vulnerable to this threat since they are already plagued by internal conflicts such as civil wars. For example, an 18-month study of Sudan by the UN Environment Programme reveals that depreciation in the amount of rainfall, decrease in crop yields and increased desertification have resulted in the exacerbation of the conflict between north and south Sudan.[21] The conflict has culminated in a permanent split between the two with the separation of southern Sudan based on a referendum in 2011. Climate change could take away the livelihoods of millions of people, especially those dependent on agriculture and fisheries, who might find an alternative in anti-social activities. Another example of the geo-political consequence of climate change is the ongoing tussle over the Arctic region. The shrinking of the ice cap has resulted in the possibility of exploration of natural resources as well as opening up of new shipping lanes in the region which could give rise to conflicting claims and tensions with regard to maritime territories and exclusive economic zones, as reiterated by the United Nations Security Council statement released on July 20, 2011.[22] Countries, including Canada, Russia, the US and Denmark, have already started to lay claims in the region. The whole concept of maritime boundaries will have to be redefined in case of submergence of coastal areas and islands, especially if they are of strategic significance.

Coming to India, migration is the single biggest threat to its national security. The rising sea levels and glacial recession are already leading to inter-regional migration. If the effects of climate change intensify, the coastal areas of Sri Lanka in the north and east that are Tamil dominated

21. See Julian Borger, "Darfur Conflict Heralds Era of Wars Triggered by Climate Change, UN Report Warns," *The Guardian*, June 23, 2007, http://www.guardian.co.uk/environment/2007/jun/23/sudan.climatechange, accessed on June 17, 2011.
22. See for more information, "Security Council, in Statement, Says 'Contextual Information' on Possible Security Implications of Climate Change Important when Climate Impacts Drive Conflict," SC/10332 (20 Jul, 2011), http://www.un.org/News/Press/docs/2011/sc10332.doc.htm, accessed on July 20, 2011.

**The most affected would be the Joint Forces Command at Andaman and Nicobar Islands and the Car Nicobar Air Force Base.**

would be affected, leading to migrations to India. Although the civil war has come to an end in Nepal, the glacial recession and extreme weather patterns in Nepal could also result in mass migrations to India. India might have to make its transit laws stringent in order to curb an influx of migrants. However, migrations from Maldives and Bangladesh would be the biggest challenges for the countries in the region. The northeastern states and some of the metropolitan cities like Mumbai are already flooded with Bangladeshi immigrants owing to different reasons — cyclones, frequent flooding and the civil war of 1971, among others. The disappearance of Maldives could force its people to seek shelter in countries across the world, especially India. However, the linkage between climate change and migration has not been appreciated by many analysts as according to them, migration is caused by poverty and unemployment, induced or exacerbated by climate change.

***Strategic Implications***

One could also evaluate the impact of climate change on the strategic interests of the major powers to interlink climate change with national interest. The most appropriate case study would be the Indian Ocean strategies of the US, India and China. The US has its largest base at Diego Garcia (Camp Justice) — an Indian Ocean island — which is only a few feet above sea level. The sea level rise could lead to the submergence of this island, taking away a critical US military staging area. Moreover, the US believes that climate change could lead to conflicts that would entail more American involvement. A recent report by the American Security Project, an advisory group of high-powered Republicans and Democrats, called global warming "not simply about saving polar bears or preserving beautiful mountain glaciers ... (but) a threat to our security."[23] As far as India is concerned, all

23 See H. Josef Hebert, "Turmoil From Climate Change Poses Security Risks," http://www.usnews.com/science/articles/2009/10/28/turmoil-from-climate-change-poses-security-risks?s_cid=rss:turmoil-from-climate-change-poses-security-risks, accessed on June 25, 2011.

its naval bases situated along the Indian Ocean rim — Cochin, Mumbai, Karwar, Visakhapatnam and others — would be afflicted marginally by the sea level rise. However, the most affected would be the Joint Forces Command at Andaman and Nicobar Islands and the Car Nicobar Air Force Base since the islands are also susceptible to tropical cyclones and tsunamis (though the former is considered safer). Thus, India's coastal security would be jeopardised even in terms of terrorist attacks and the overall defence structure of the country would be adversely affected, further aggravating the national security. The security implications of climate change will also hamper China's growing assertiveness in the region. Its deep water ports and refuelling stations in Gwadar, Hambantota, Chittagong, Sittwe and Kyaukphyu are situated along the most vulnerable coastlines. However, these conjectures do not have the potential to alter the overall geo-political rivalries between those nations. At the same time, the efforts to protect these coastal installations through various ways, including raising them even further above the current sea level so that they are not affected by the sea level rise would prove to be expensive and short-term solutions.

## LOOSE ENDS TIED TOGETHER

The divisions and sub-divisions, the causes and consequences, the perceptions and misperceptions, the solutions and resolutions are inherent in the global climate change debate. For the emerging countries, climate change is an economic issue of developmental concerns; for the industrialised countries, it has more or less become a political-cum-ethical issue concerning *raison d'etat* and developmental supremacy; for the least developed countries, it is a human rights issue that endangers their survival. For the theorists — modernists and ecoradicals — it is a solvable issue through distinct approaches but they have been largely inadequate in terms of being put into practice. Climate change, whether caused by human activities or natural processes, is an issue of concern and, thus, needs to be one of the top priorities for the policy-makers. Climate scepticism is a regressive movement that would only lead to the false belief that exploitation of the environment is the birthright of human beings. There are innumerable indications and

studies that should clear the doubts in the minds of the sceptics. India is definitely one of the biggest victims of these signals and the future does not look bright. Not only does climate change affect its socio-economic sectors, it clearly has an adverse impact on its national security that is closely linked to the society and the economy as well as its strategic interests.

There is a section of thinkers according to whom human beings must go back to their roots and believe in deep green ideology. Instead of shifting the responsibility to the nation-states, steps have to be taken at the individual level to tackle this issue. While individual actions could certainly make a lot of difference, it has to be kept in mind that large-scale environmental degradation and climate change can be addressed only if initiatives are undertaken by nation-states. In a world divided by sovereignty and national interests, climate change is one phenomenon that is common for all countries; the only difference being that some countries could face the wrath of nature way before others. Therefore, the onus lies on all nations, especially those who have been responsible for it in the past and those who are adding to the problem in the present, to not only have extensive 'green' policies at home but also assist those countries that are at higher risk than others.

World leaders across the globe are trying different means to articulate their stands on climate change: for example, a Cabinet meeting held under water by Maldives in 2009, a meeting held by Nepal at the altitude of 17,192 ft at the base of Mount Everest and a Cabinet meeting held in the middle of the Gobi desert by the Mongolian Ministers wearing "Save the Planet" baseball hats in 2010. India is also doing its bit to not only galvanise the international community towards a collective arrangement but also carrying out programmes within the confines of its boundaries. The widening gap between 'what has to be done' and 'what is done' in reality is the biggest hindrance in reorganising the global climate change architecture in favour of a brighter future.