Climate Change in South Asia: A Framework of Sustainable Development and Human Security

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Abstract Climate change is increasingly been called a ‘human security’ problem, and there has been speculation that climate change may increase the risk of violent conflict. The broad contours of a research programme to guide empirical investigations into the risks climate change poses to human security and peace. It is now increasingly realised that even with the currently agreed regime of emissions control, concentrations of greenhouse gases (GHG) are likely to rise over the next few decades and over the millennia. Climate change is likely to threaten all life forms on earth with the extent of vulnerability varying across regions and populations within regions. Changes in temperature and precipitation patterns and numerous other factors will impact both natural and human systems. Climate sensitive sectors like agriculture, forestry, water resources and coastal regions, and, human systems including human health, human settlements, in dustry and energy sectors will be drastically affected. The South Asian experience can contribute to the larger literature on environment and security and, more particularly, to the literature on human security and sustainable development. It argues that chronic and structural impoverishment— rather than resource scarcity alone— forges the connection between environmental degradation and conflict. It also suggests that poverty and weak institutions of governance are the more immediate triggers of environmental insecurity.

Keywords: climate change, human security, sustainable development, South Asia, international cooperation


1. Introduction

Climate change has attracted unprecedented attention in recent years. It has been referred to as the defining human development issue of our generation. While climate change originated as an environmental problem, it now impinges on every aspect of human life including international peace and security. South Asia provides an interesting case study to discuss climate change as the challenges facing these countries are wide and varied yet they share similar cultural and socio-economic backgrounds. Issues relevant to India which is fast industrializing will be different from the Maldives, which is threatened by submergence due to rising sea levels giving rise to “climate refugees.” Problems facing Sri Lanka, an island nation, will be different from Nepal and Bhutan which are landlocked states. At the same time, these countries are plagued by conflict, poverty and malnutrition. The effects of global warming on the Indian subcontinent vary from the submergence of low-lying islands and coastal lands to the melting of glaciers in the Indian Himalayas, threatening the volumetric flow rate of many of the most important rivers of India and South Asia. (Penny Christopher: 2007).

The South Asian region is one of the most densely populated and at the same time most exposed regions in terms of the threats of climate change. A considerable section of the South Asian population is dependent on agriculture for their livelihood and they have to bear the brunt of the vagaries of the changing climate. It is estimated that by 2050, the population of South Asia will increase to reach 2.2 billion from the current figure of 1.5 billion. With an estimated 600 million South Asians subsisting on less than $1.25 a day, even relatively small climate shocks can cause irreversible damage and push a large number of people into destitution. Over the years the South Asian region has experienced significantly longer summers and in some cases severe heat waves. In many parts of South Asia, the frequency of more intense rainfall has increased-leading to severe floods, landslides and debris flow. At the same time, the total amount of precipitation has declined. (worldbank.org).

2. Human Security: A Paradigm Shift

Environmental issues have been seen in the broader context of human security since the end of the Cold War. This marked the end of both the political bipolarity and the narrow, mainly military notion of security concepts and perceptions which dominated the security discourse at
that time. A number of United Nations’ Conventions directly and specifically address environmental issues that have great bearing on societies worldwide and contribute indirectly to improving several of the dimensions of human security. The UNDP Human Development Report, (1994) defined human security as ‘safety from chronic threats such as hunger, disease, and repression as well as protection from sudden and harmful disruptions in the patterns of daily life – whether in homes, in jobs or in communities’, and as the totality of economic security, food security, health security, environmental security, personal security, community security and political security. Human security has become ‘both a new measure of global security and a new agenda for global action’. Culture, economies, trade, production-lines, values, politics are no longer framed within national boundaries, peoples of the world are connected through their actions and inactions, and as such threats to security and livelihoods transcend state apparatus. Human security as a concept first surfaced in the early 1990s when it became increasingly clear that the end of the Cold War would not be accompanied by an end to armed conflict but that instead the nature of violent conflict was changing, away from traditional interstate war towards intrastate conflicts fuelled by ethnic, religious, or ideological divisions. The discourse about security became enriched with the new insight that states are not the only entities whose security ought to concern us. Regions, communities, families, and individuals can only feel secure if they have reason to believe that their continued functioning is not going to be threatened at every turn. Furthermore, the security of the state largely depends on the security of regions, communities, families, and individuals. And occasionally states fail to fulfil their obligations as security guarantors, even to the point of threatening the security of their own citizens. It was realised that a primary requirement for human security was not merely the absence of war but the absence of structural and personal violence. These realisations informed a shift in perspective from the state as the subject and object of security policy to the human individual as the centre of security considerations – from state security to human security. And since human beings, unlike states, are capable of sensations and emotions, human security was recognised as partly contingent on those particular states of mind that we tend to associate with human well-being.

Human Security focuses primarily on protecting people while promoting peace and assuring sustainable continuous development. It emphasizes aiding individuals by using a people-centred approach for resolving inequalities that affect security. One of the major failings of Human Security, according to its critics, is that it is too all encompassing and that it fails to achieve its ambitious goals for improving the human condition. Still, the relevance of this concept for addressing the world’s most pressing issues seems clear. Security has gone global. It is no longer simply related to the security of nation states. The security of the individual now directly impacts the security of the state and vice versa. By the beginning of the 21st century, climate change and harrowing effects of natural hazards like extended drought or extreme hurricanes, crushing economic inequality, disease, lack of resources and resulting migration have all shaped a new reality for the human security paradigm. The paradigm inseparably links humans, their social systems, and their environments and strives to achieve freedom and fear, freedom from hazard impact, and freedom from want. The paradigm has been shaped in part by recognition of the need to achieve greater societal resilience and improved environmental conditions among the world’s most vulnerable people.


Human-driven changes in the terrestrial surface of the earth hold wide-ranging significance for the structure and function of ecosystems to the earth system, with equally far-reaching consequences for human well-being. Deforestation and irrigation were the largest sources of human-released greenhouse gasses to the atmosphere until the advent of industrial era fossil-fuel burning, and as much as 35% of the human-induced CO2 equivalents in the atmosphere today can be traced to the totality of land-use/cover changes. Today, as much as 50% of the earth’s
ice-free land surface has been transformed, and virtually all land has been affected in some way by such processes as adapted landscapes, climate change, and tropospheric pollution.

The main factor in anthropogenic climate change is the increase in the concentration of carbon in the atmosphere over time. This increased concentration has been caused by the emission of GHGs as a result of economic activities, including energy, industry, transport, and land use, many of which rely upon fossil fuels. The most important GHG, carbon dioxide, CO₂, currently constitutes 77 per cent of the global warming potential. Other contributors are methane (from agricultural sources), and land use change such as deforestation. Concentration level has increased because emissions during the last two centuries were in excess of what could be absorbed, and the excess GHGs began to accumulate in the atmosphere. The concentration of CO₂ alone has increased by some 100 ppm over this period (Stern 2006). Current global emissions contribute another 2-3 ppm of carbon dioxide equivalent (CO₂) GHGs per year.

Climate change has become one of the fundamental concerns of the 21st century. Ultimately, climate change is all about humans acting in socio-ecological settings in which biophysical, socio-cultural, economic, institutional, political, and legal mechanisms operate. It is in this complex system that disasters emerge and that society has to cope with. Human security within the context of climate change remains relatively under explored, whereas the biophysical dimensions of climate change, both on a worldwide and regional scale, are more rapidly addressed by natural scientists. Thus, there is an urgent need to deal with climate change through both adaptation and mitigation.

Climate Change is increasingly recognized as a major human security issue that poses serious global threats. Although climate change affects everyone regardless of race, caste, ethnicity, sex and level of income, its impacts are more heavily felt by poor nations, communities and people, and climate change magnifies existing inequalities. For the world’s poor the impact will be most severe, disproportionately affecting their livelihoods and security. Climate change is a grim reality. Scientists tell us that the world is getting warmer by the day. Extreme weather phenomena such as floods, droughts, heat waves and cyclones, experienced in different parts of our globe, are among the far reaching consequences of climate change, giving us a bitter foretaste of what worse may come in the near future.

The link between climate change and human security is now as clear as ever. Dramatic environmental change undeniably places the infrastructure of all countries to the test. But it also poses an even greater threat to developing countries that lack the means, the know-how and the capacity to effectively deal with this phenomena. Add to this the soaring food and oil prices, and the future for millions of people across the globe, particularly those living on the edge struck by poverty or ravaged by war, is ominous.

3. Climate Change and Human Security

The literature on environment and security has evolved over the years: from an early focus on incorporating environmental and related concerns into the definition of “security” to a new focus on how environmental change can be a cause or amplifier of violent conflict. An emerging trend within this evolution has been a move toward greater emphasis on the concept of human security.

Human security is not in opposition to the earlier trends of redefining security or of mapping the environmental roots of violent conflict. In fact, it is an outgrowth of these trends. Indeed, many early attempts to broaden the definition of “security” used language very similar to that found in today’s discussions on “human security.” For example, consider the following definition from Norman Myers’ Ultimate Security…: “security applies most at the level of the individual citizen. It amounts to human well-being: not only protection from harm and injury but access to water, food, shelter, health, employment, and other basic requisites that are the due of every person on Earth. It is the collectivity of this citizen’s needs—overall safety and quality of life—that should figure prominently in the nation’s view of security. Those analysts who have focused on explicating the environmental causes of violent conflict have also brought the debate closer to the notion of human security—most noticeably by focusing on intrastate (often conflicts that can…become a feature of state insecurity…). If peoples and communities are insecure (economically, socially, politically, environmentally), state security can be fragile or uncertain.

Today, environmental change including climate change presents a new threat to human security and a new situation for migration. By 2050 when human population is projected to peak, some 9 billion people will live on Earth. The majority of them will live in urban areas with crushing environmental footprints. Many megacities are located in areas prone to sea level rise. Climate change will visit urban and rural areas alike with increasingly frequent and violent hazard events. Flooding, intense storms, or droughts, or more gradual but similarly intense changes in regional climates place great stress on livelihood systems.

Research on the effects of specific stressors like environmental degradation on society grew during this time period. Environmental issues have been seen in the broader context of human security since the end of the Cold War, which marked the end of political bipolarity and the narrow, mainly military notion of security that predominated the discourse at that time. The Brundtland report (1987) introduced the concept of sustainable development, followed by broad public discussion and a series of United Nations summits on environment and sustainable development (World Conferences in Rio 1992 and Johannesburg 2002). In this respect, the United Nations Conference on Environment and Development (UNCED), informally known as the Earth Summit, held in Rio de Janeiro in 1992 was a critical point in mainstreaming environmental issues at the international level. The event heralded the development of various UN Conventions dealing with environmental issues, for example, the UN Framework Convention on Climate Change (UNFCCC), the Convention on Biological Diversity and the United Nations Convention to Combat Desertification (UNCCD). These conventions and conferences directly and specifically address environmental issues that affect human security.
4. Sustainable Development in South Asia

South Asian countries while sharing similar geographical and cultural features, are also very diverse: the region has the country with the second largest population in the world (India), a small island state (Maldives), an island nation (Sri Lanka), land-locked countries (Nepal and Bhutan), two nuclear power states (India and Pakistan), and a country located on a river delta (Bangladesh). They are very rich in biological diversity as the region is home to many tropical rainforests and world heritage sites. South Asia is home to well over one fifth of the world’s population and is one of the most densely populated areas of the world. Most countries in the region are prone to conflict and political instability and are also plagued by poverty and corruption. Sri Lanka enjoys the highest GDP per capita and the highest literacy rate in the region while India alone accounts for 5.6 million child deaths per year. According to the World Hunger Index, the region also has the highest child malnutrition rate in the world.

The south Asian region accounts for five per cent of the world’s land but houses 20 per cent of the global population. The population density is the highest with 260 people per sq. km. in contrast to the global average of 44 people per sq. km. Also poverty is widely prevalent with one third of the population living under one dollar a day. To add to this, the effects of climate change have been on the rise in this part of the globe. The erratic weather patterns, retreating Himalayan glaciers causing frequent floods and droughts coupled with the diverse ethnic beliefs and internal conflicts further complicate adaptation measures and pose significant threat to national and human security. South Asia is a zone of instability with unstable governments and inter and intra state conflicts. It is also home to some of the poorest countries in the world. In addition to the existing conflicts, climate change throws up new challenges in the form of water scarcity and resultant water disputes and also other national security issues along the unsettled boundaries. On the other hand, India is fast industrializing, and has made tremendous strides in the field of science and technology – it even made its mark on the moon recently. Bangladesh and Nepal are among the poorest countries in the world while the Maldives, consisting of atolls barely above the sea level, is a tourist haven. While Sri Lanka was the first country in the region to liberalize its economy its development efforts have been undermined by the 25 year old civil war that ravaged the country. Tensions have always been high between the two nuclear powers – India and Pakistan. India, by far the largest and the most populous country in the region, has naturally been its dominant political power.

In South Asia there are at least forty-seven million people living in highly vulnerable Low Elevation Coastal Zones in Bangladesh, India and Pakistan. These zones include one of the most populous delta regions of the world—and megacities such as Mumbai, Kolkata, Dhaka and Chennai—where some areas are only 2–10 metres above the current sea level. As flooding and drought increase in frequency, this will have devastating impacts on livelihoods, and slow economic growth within the countries of South Asia, thereby increasing the number of people living in poverty and the number of triggers for displacement and forced migration. Small farmers living in the coastal zone are particularly vulnerable to storm surges, salt water ingress, and flooding which damages crops and creates conditions for seasonal attacks by insects and rats. Rural wage labourers are even more vulnerable to climate changes as their opportunities for employment will be reduced and as they will have fewer assets to sustain their households during times of disasters. In urban areas, poor households are particularly vulnerable as their members are forced to live in ‘high risk areas’ due to a lack of affordable housing and to a lack resources needed for adaptation to changing climatic conditions. Effective responses to climate-related displacement need to be informed by a robust research base, with a strong and dynamic social science approach bringing together local, regional and international knowledge and experience.

Data shows that there is a sharp increase in the number of natural calamities with extreme weather events like cyclones or droughts. With a broad coastline and millions calling it home the loss of life will be monumental. Over the past forty years, there have been as many as 1333 disasters in South Asia that claimed 980,000 lives, affecting another 2.4 billion people and causing an economic loss of $105 billion. This number is only set to go higher with further increase in flooding due to the melting glaciers followed by droughts as the Himalayan rivers, once perennial, become seasonal. So, collective action is the way forward with substantial financial and technological help from the developed countries. The South Asian Association for Regional Cooperation (SAARC) the regional grouping of 8 countries has recognized climate change as a key issue to be dealt with at a regional level during their third meeting in Nepal in 1987 and has constituted various committees to look into the affects and suggest mitigation measures. But as a result of various factors like lack of political will, consensus and other priority issues not much substantial has happened since. The broad outcome of all the factors in this region is large scale migration and displacement. Eighty per cent of Bangladesh is prone to submergence due to floods and any sea level rise will result in submergence of a large part of its coastline. This will result in distress migration and scramble for scarce resources. For instance, in 1998, Bangladesh was flooded and submerged from few days to several months resulting in more than a 1000 deaths, half a million homes damaged and about 30 million people displaced. The loss only went up north in November 2007 as cyclone Sidr, the worst cyclone since 1991, battered Bangladesh again killing 3000 people and affecting over seven million people. Similarly Pakistan too is highly flood prone as was witnessed in July 2010. In addition, the sectorial strife, ethnic unrest and political instability can break down the entire federal machinery which might be filled by fundamental elements, a geopolitical nightmare. Other countries in the region Bhutan, Nepal and Sri Lanka too are no different. The disaster management in the region is inadequately prepared to tackle these challenges and there is no gender based approach to address the plight of women, children and other backward societies. A study of the recent flood in Dhaka, Bangladesh reinforces this point where more women lost their lives as they couldn’t swim and did not have proper facilities in relief camps such as closed bathing spaces and shelters.
India has been traditionally vulnerable to natural disasters on account of its unique geo-climatic conditions. Floods, droughts, cyclones, earthquakes and landslides have been a recurrent phenomenon. About 60% of the landmass is prone to earthquakes of various intensities; over 40 million hectares is prone to floods; about 8% of the total area is prone to cyclones and 68% of the area is susceptible to drought. A natural hazard has been happened in Kedarnath valley due to torrential rainfall during 16 and 17 June 2013. From 14 to 17 June 2013, the Indian state of Uttarakhand and adjoining areas received heavy rainfall, which was about 375 per cent more than the benchmark rainfall during a normal monsoon. This caused the melting of Chorabari Glacier at the height of 3800 metres, and eruption of the Mandakini River which led to heavy floods near Gobindghat, Kedar Dome, Rudraprayag district, Uttarakhand, Himachal Pradesh and Western Nepal, and acute rainfall in other nearby regions of Delhi, Haryana, Uttar Pradesh and some parts of Tibet.

### Contribution to Greenhouses Gas Emissions by Sector and Country in South Asia

<table>
<thead>
<tr>
<th>Sector</th>
<th>Afghanistan</th>
<th>Bangladesh</th>
<th>Bhutan</th>
<th>India</th>
<th>Nepal</th>
<th>Pakistan</th>
<th>Sri Lanka</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Transformation &amp; Use</td>
<td>--</td>
<td>32</td>
<td>--</td>
<td>1068</td>
<td>5</td>
<td>112</td>
<td>11</td>
</tr>
<tr>
<td>Electricity &amp; Heat</td>
<td>--</td>
<td>9</td>
<td>--</td>
<td>558</td>
<td>0</td>
<td>34</td>
<td>3</td>
</tr>
<tr>
<td>Manufacturing &amp; Construction</td>
<td>--</td>
<td>10</td>
<td>--</td>
<td>231</td>
<td>1</td>
<td>27</td>
<td>1</td>
</tr>
<tr>
<td>Transportation</td>
<td>--</td>
<td>3</td>
<td>--</td>
<td>92</td>
<td>1</td>
<td>25</td>
<td>6</td>
</tr>
<tr>
<td>Other Fuel Combination</td>
<td>--</td>
<td>10</td>
<td>--</td>
<td>147</td>
<td>3</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Fugitive Emission</td>
<td>--</td>
<td>0</td>
<td>--</td>
<td>40</td>
<td>0</td>
<td>9</td>
<td>--</td>
</tr>
<tr>
<td>Industrial</td>
<td>--</td>
<td>2</td>
<td>0.1</td>
<td>71</td>
<td>0</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: Mohanty Ashutosh, “Greater South Asia’s Regional Impacts of Climate Variability, Change and Extremes II” Presentation at the “International Graduate Conference on Climate Change and People”, National Trust for Nature Conservation (NTNC), Kathmandu, Nepal.

As Sir Nicholas Stern noted: “From the Himalayas, which feed water to a billion people, to the coastal areas of Bangladesh, South Asian countries must prepare for the effects of global warming, even as they work to combat the human causes of climate change.”[16] For example, it is not clear what effect climate change will have on the monsoons. Already Bangladesh has witnessed the impact of adverse weather: “Between 1991 and 2000, 93 major disasters were recorded in Bangladesh, resulting in 200,000 deaths and causing US $5.9 billion in damages.[17] Unfortunately, climate change will only exacerbate these consequences. The Stern Review also projects that severe deterioration of local weather would lead to mass migration and conflict: “Rising sea levels, advancing desertification and other climate driven changes could drive millions of people to migrate: more than a fifth of Bangladesh could be under water with a 1m rise in sea levels – a possibility by the end of the century.”[18]

### Change in average temperature and rainfall in some South Asian countries:

<table>
<thead>
<tr>
<th>Country</th>
<th>Change in temperature</th>
<th>Change in precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>An increase in temperature by 0.68° Celsius</td>
<td>Increase in heavy rains during North-west monsoons and fewer rainy days along the east coast.</td>
</tr>
<tr>
<td>Nepal</td>
<td>Rise in temperature in the range of 0.09° Celsius in the Himalayas and in the range of 0.4° Celsius in the Terai region.</td>
<td>10-15% decrease in rainfall in the coastal belt. Increased summer and winter rainfalls in North Pakistan.</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Increase of about 10 Celsius in May and 0.5° in November from 1985-1998</td>
<td>Decadal long anomalies are on the rise since 1960s</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>.016° Celsius increases per year in temperature between 1961-1990.</td>
<td>Increasing rainfall in February and decreasing rainfall in June.</td>
</tr>
</tbody>
</table>


The range of climate change impacts in South Asia includes: water shortages, increased salinity, inundation of low lying cities, less water for agriculture, soil erosion, increased incidence of disease, extreme weather events and loss of endemic species.[19] These coupled with poverty and conflict, reliance on an agricultural economy and lack of infrastructure and other social safety nets, make the situation rather bleak. TERI in its report summarizes the situation:

Figure 2. The interactions between the atmosphere, land surface, and ocean by accounting for the various mechanisms described in the picture (Source: Sarah Opitz-Stapleton (2009) “Climate Change and South Asian Impacts”, working with the winds of change, chapter, 3, pg. 59)

“Various studies summarized in this paper show that climate change is a grave and immediate issue for South Asia. The impacts of climate change on food security, access to water, human health, ecosystems, urban areas,
and frequency of disasters will have severe implications for the achievement of sustainable development. Present coping capacity is very limited particularly for small farmers, rural communities eking out precarious livelihoods dependent on natural resources, urban poor living in marginalized conditions, women and children.”

5. Challenges in South Asia

Across South Asia there are various ‘hot spots’ where it is predicted that climatic changes will have a very large impact. These ‘hot spots’ are: the Eastern Ganges Basin; the major river deltas (i.e. the Ganges-Brahmaputra, the Indus and the Kaveri); the arid zones in Afghanistan, Pakistan and Western India; the Deccan Plateau; the middle hills of the Himalaya and the High Himalayan regions; and coastal areas affected by salinity, extreme storms and sea-level rise. Across the Ganges basin, the specific vulnerabilities to which climate change contributes are droughts, floods, super cyclones and other storms, and sea-level rise. The entire basin is heavily dependent on the monsoonal system. In the upper reaches, the Himalayan glaciers, which provide the winter flows, are experiencing changes in melting rates and density.

Bangladesh will be one of the most severely affected countries because nearly eighty per cent of its total land area is prone to flooding. Every year approximately twenty to twenty-five per cent of the country is inundated by floods from rivers, heavy monsoonal rainfall and storm surges, worsened by poor drainage and haphazard development in urban areas. But with increasing frequency, floods are inundating much larger areas. For example, in 1998, about 80 per cent of Bangladesh was flooded for between a few days and several months. This caused more than a 1,000 deaths, damaged more than half a million homes and affected an estimated 30 million people. In India, monsoonal floods frequently inundate states such as Bihar. This was the case in 2008 when the Kosi River changed its course, affecting 4.7 million people. Cyclones coming up the Bay of Bengal have affected many coastal regions, including the megacities of Dhaka and Calcutta. In July 2005, floods brought Mumbai to a standstill for 48 hours, following a day of record rainfall.

It is a major reason for the increasing impoverishment and marginalisation of rural households and communities. This riverbank erosion is exacerbated by the intensity of floods created by melt water from glaciers, which are expected to increase as the global temperature rises. During the dry season these same populations face water and food insecurity. At particular risk from sea-level rise are the people living on the islands of the Sunderbans in the Bay of Bengal. The decrease in flow of the Ganges River due to the construction of the Farakka Barrage in West Bengal (India) now means that seawater pushes up the delta, creating heavy inland flooding during tidal surges. This has destroyed rice fields and thus forced people to find alternate jobs in Bangladesh. While some employment has been created by the cultivation of shrimp, they are too expensive for local consumption and this has meant that rice must now be imported. This further marginalises the poor, and, with the decrease in employment, forces many men to migrate, leaving behind women, children and the elderly.

6. Displacement and Migration

A crucial issue that will have to be addressed by the South Asian region is how it will deal with displacement and possible migration due to sea level rise and other severe weather events. This is particularly crucial for low lying cities such as Dhaka, Mumbai and Karachi and small island states such as the Maldives. The entire costal belt of Sri Lanka is vulnerable to sea level rise and already much land has been lost due to sea erosion. The issue of displacement and migration would be a good issue to be addressed within the framework of SAARC. The Stern Report warns that many people in developing countries will be displaced as a result of climate-related incidents: “Severe deterioration in the local climate could lead, in some parts of the developing world, to mass migration and conflict, especially as another 2-3 billion people are added to the developing world’s population in the next few decades.” It points out that rising sea levels, desertification, and other climate-related events could drive millions to migrate. More than one fifth of Bangladesh could be under water by the end of the century. With a predicted one meter rise in sea levels, the Maldives could be completely submerged as well. A similar fate awaits people living in low lying cities and Small Island states. It has been estimated that 634 million people live in low-lying coastal areas vulnerable to sea level rise associated with climate change and cities from Tokyo to New York would be affected. Migration away from the zone at risk will be necessary. It is generally accepted that sea level rise in the long term will cause displacement of many millions of people currently living in coastal areas: “For the small island nations of the world, especially the many cultural groups living on coral atolls, entire nations face complete submersion.”

Box 1: An avoidable environmental tragedy in India, June 2013

In June 2013, the North Indian states of Uttarakhand and Himachal Pradesh, some regions of Western Nepal and their adjoining areas in the Indian states of Bihar and Madhya Pradesh, some regions of Western Nepal and their adjoining areas experienced heavy rainfall that triggered devastating floods and landslides. Parts of Haryana, Delhi and Uttar Pradesh, and some parts of Western Tibet also experienced heavy rainfall. As of 29 June 2013, more than 1,000 people have died with many more missing. The terrible floods in India’s tiny north Himalayan state of Uttarakhand, which killed more than 1,000 people, left 70,000 stranded for days and destroyed livelihoods, have been officially termed a natural calamity caused by cloudbursts and unprecedented heavy monsoon rainfall.

However, the true causes of the epic tragedy lie in the grievous damage recently wrought on the region’s ecology by the runaway growth of tourism, unchecked proliferation of roads, hotels, shops and multi-storey housing in ecologically fragile areas, and above all mushrooming hydroelectricity dams that disrupt water balances. There was local-level governance failure, too. Haphazard, unregulated construction of roads and bridges was allowed on crumbling, landslide-prone ridges and steep slopes, ignoring the region’s fragile geology and high earthquake vulnerability. Forests were destroyed on a large scale. Hundreds of buildings were constructed in the flood plains of rivers, their “natural” terrain, which should be no-go areas. Riverbeds were recklessly mined for sand. Indiscriminate building of hydroelectric dams was the worst culprit. These involve drilling huge tunnels in the hills by blasting rocks, placing enormous turbines in the tunnels, destroying soil-binding vegetation to build water channels and other infrastructure, laying transmission lines and carelessly dumping excavated muck. Many dams have been built on the same river so close to one another that they leave no scope for its regeneration.

Dams steal water from local people. They alter the hydrological cycle and natural course of rivers. Uttarakhand 70 completed large dams have diverted more than 640km, equivalent to half the length of its major rivers. They have profoundly destabilised its ecology.

7. Assessing Human Security through Sustainability in South-Asia

Political scientist Robyn Eckersley has noted that developments after the Cold War placed as potlight on “neglected areas of vulnerability and marginalization,” on interdependence between the global natural environment and the global economy, and on the necessity for cooperation at the international level. The interactive relationships between peace, environment, development, and economy as matters of security were successfully recognized by the Brandt Commission (1980), Brundtland Commission (1987), the Rio Declaration (Principle 25) (1992), the United Nations Development Programme (UNDP) (1994) (as a component of human security), The Commission on Global Governance (1995), and even, in April 2007, by the UN Security Council. Eckersley has identified four main themes of a broader approach to security with regard to the environment since the end of the Cold War: the emergence of new understandings of “ecological risks” as sources of insecurity; a recognition of new security referents such as the biosphere and “ecological communities”; creative responses to ecological threats based on cooperation and dialogue linked to various levels and kinds of governance; and identification of the prerequisites for “long-term security” and sustainable development, such as ecological and communicative justice based on critical, Habermasian, and constructivist theories.

Both the equity and connectivity dimensions of climate change underscore the importance of sustainable adaptation. The broader goals of most sustainability efforts are to foster economic and social practices that contribute to the maintenance of environmental quality, diversity of species and preservation of ecological functions for the benefit of both humans and other living things. Sustainability emphasizes the idea of using natural resources in a manner that meets the needs of the present generation without compromising the ability of future generations to meet their needs. Adaptation to climate change can be described as adjustments in practices, processes, or structures to take into account changing climate conditions, to moderate potential damages, or to benefit from opportunities associated with climate change. Combining aspects of both sustainability and adaptation, the notion of sustainable adaptation entails measures that reduce vulnerability and promote long-term resilience in a changing climate.

Two broad principles define the general concept of sustainable development:

1. “The right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generation.”
2. “In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.”

These two principles broadly relate to the notions of inter- and intra- generational equity, respectively. The real challenge, however, is to translate the principles into concrete policies for national development. As an example, none of the countries in South Asia has been able to develop an apex national council or mechanism focused on sustainable development. The misperceptions that economic and industrial development should take precedence and that incorporating environmental concerns would have an adverse impact on development are quite prevalent throughout the region. At the moment the South Asian nations are caught in a vicious cycle of poverty, environmental resource depletion and lack of development.

The existing development paradigm should receive careful consideration and perhaps requires some rethinking, given the prevailing conditions in the region. The primary target of such efforts must be the reduction of poverty in the region, particularly when the number of people living below the poverty line currently stands in excess of half a billion. A number of factors contribute to this situation, including weak incentives for improved service delivery to the poor, rampant corruption, imperfect monitoring and administrative obstacles. The rampant poverty and low quality of life have other indirect consequences, such as increased vulnerability to natural disasters. Poverty can also be linked to a number of “environmental” health problems, including a lack of sufficient and clean water, food, appropriate shelter and fuel, and access to healthy air. The most poignant example of this is arsenic poisoning through drinking water in South Asia, which affects huge numbers of people- over 35 million in Bangladesh, 2 million in India and 100,000 in Nepal.

Of the many drivers of environmental degradation, urbanization is perhaps the most significant because of the major trend of increasing urbanization (3.4 per cent annual growth in South Asia’s urban population), a lack of proper planning, and the exploitation of natural resources under the urban footprint and the generation of vast quantities of waste. Some of the largest and fastest growing cities in the

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**Box:2 Sri Lanka and its Biodiversity**

Due to its location and topography, Sri Lanka, is one of the smallest but biologically most diverse countries in Asia. Consequently, it is recognized as a biodiversity hotspot of global importance. Among the terrestrial ecosystems are forests varying from wet evergreen forests to dry thorn forests, grasslands, wetlands and freshwater bodies and a complex network of rivers. These together with the coastal and marine ecosystems such as sea grass beds, coral reefs, estuaries and lagoons, and associated mangrove swamps constitute the diverse and complex network of ecosystems in the country. In addition, there are numerous man-made ecosystems related to agriculture and irrigation, which have a direct bearing on the conservation, sustenance and survival of biological resources.

Sri Lanka’s high population density, high level of poverty, and wide spread dependence on subsistence agriculture are exerting considerable pressure on the biodiversity of the country. Extensive land degradation and deforestation and the unregulated exploitation of natural resources (e.g. Mining for coral lime, sand and gemstones) are some of Sri Lanka’s most pressing problems. In response, the National Conservation Strategy, the National Environmental Action Plan, the Forestry Sector Master Plan, the National Coastal Zone Management Plan and Coastal 2000 are some of the policy instruments that are addressing biodiversity conservation. There are also many Government Institutions whose responsibility is to translate these policy initiatives into action. However, despite the legal, policy and institutional support for its conservation, the country’s biodiversity is continuing to diminish. The growth and movement of population, the opening of economic markets, and new trends in industrial development are expected to have a growing adverse impact on biodiversity unless some systematic and stringent corrective measures are taken.

Sri Lanka ratified the Convention on Biodiversity in 1994 and as a response to article 6 of the Convention; the preparation of “Biodiversity Conservation in Sri Lanka- A Framework for Action” began in early 1996. What this plan proposes is a course of action to ensure that the biological diversity within the country is conserved and used sustainably.

*Source: Forestry Sector Master Plan of Sri Lanka 1995*
world are located in South Asia. Industrial growth also poses a challenge, primarily through the production of waste but also through exploitation of the limited natural resource base. For example, an environmental impact assessment (EIA) is still not fully established as a requirement for the establishment and operation of industries.

A major proportion of the land surface in the South Asia region is becoming degraded, leading to a decrease in land productivity and even more importantly, threatening the food security of the countries in the region. The causes of this degradation are many and varied, including declining forest cover, inappropriate agricultural practices, destruction of natural vegetative cover for development, inadequate maintenance and management of the vast canal-based irrigation system, and industrial and mining waste. Climate change and global warming are the most serious environmental threat to the region in many ways. They many reduce availability of water resources and a likely increase in climate-related extreme events. Prolonged drought in south and central Asia over the past few years is a concrete example of such impacts. Conversely, extreme flooding events in Bangladesh and southern India have also become more frequent. Another indirect threat from global warming is sea-level rise, particularly for countries such as Maldives (which could be completely submerged) and Bangladesh (which could lose up to one-third of its surface area) as a result of even a 0.5 metre rise in sea level.

8. Impact of Climate Change in South Asia

South Asia is one of the most climate impacted regions in the world. Many studies are now available to support that fact. For instance, the World Bank has identified three unique factors that make South Asia vulnerable to the impacts of climate change:

- Poverty and population increase;
- Threats to water supply and agriculture; and
- Vulnerability to natural disasters.

First, South Asia has the highest density of poverty in the world. With an estimated 600 million South Asians subsisting on less than $1.25 a day, even small climate shocks can cause irreversible losses and tip a large number of people into destitution.

Second, South Asia is endowed with great rivers, which are the lifelines of the regional economy. The ice mass covering the Himalayan-Hindu Kush mountain range is the source of the nine largest rivers of Asia, including the Ganges, Brahmaputra, and Indus. Glacial melt coupled with more variable precipitation could severely compromise livelihoods and the future prospects of agriculture.

Third, South Asia suffers an exceptionally high number of natural disasters. Between 1990 and 2008, more than 750 million people - 50% of the region’s population - were affected by a natural disaster, leaving almost 60,000 dead and resulting in about $45 billion in damages. As climate-related risks intensify, there will be a need to respond proactively to build resilience through prevention and preparedness rather than through relief and response.

South Asian leaders issued a Statement on Climate Change at their meeting in April 2010, at Thimpu. They recognise that the Member States of SAARC as developing countries face the dual challenge of addressing the negative impacts of climate change and pursuing socio-economic development. The Statement emphasises the overriding importance of socio-economic development and poverty eradication in our region, and that reducing dependence on carbon in economic growth and promoting climate resilience will promote both development and poverty eradication in a sustainable manner.

These points to the imminence of development strategy that is both sustainable and inclusive. South Asian governments have to work together to share knowledge, technology, and finance. Work on this is already underway within the rubric of SAARC as well as various bilateral agreements. This will have to be followed-up with speed and sincerity.

South Asian private sector will have to be engaged, because it is they who seek new opportunities to work on. Sustainability is reservoir of opportunities which needs to be dwelled upon by the private sector. It is important for business to realize that they are held back by the same factors that keep individuals and communities in poverty, which is environmental deterioration, and the absence of adequate infrastructure.

End Notes

[3] See the discussion in section 2.3 infra.
[8] For example, the World Bank includes only the original SAARC countries and leaves Afghanistan out: Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka while some definitions include countries such as Singapore and Iran. See http://en.wikipedia.org/wiki/South_Asia
[9] Ibid.
[10] Id. The Global Hunger Index is available at: http://www.worldhunger.org/articles/Learn/world%20hunger%20facts%202002.htm
References


