South Asia Disaster Report
Special Copenhagen Issue

A Hot-Spot About to Become Hotter

A South Asian perspective on Climate Change and increased Disaster Risk

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PRACTICAL ACTION
Technology challenging poverty

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Abbreviations

CDM:	Clean Development Mechanism
GAR:	Global Assessment Report on Disaster Risk Reduction of UNISDR
GEF:	Global Environmental Facility
GLOF:	Glacial Lake Outburst Floods
IPCC:	Intergovernmental Panel on Climate Change
LDCF:	Least Developed Country Fund
NAPA:	National Adaptation Programme of Action
SADR:	South Asia Disaster Report
SIDS:	Small Island Developing State
UNFCCC:	United Nations Framework Convention on Climate Change
UNISDR:	United Nations International Strategy for Disaster Reduction

How Global Warming Will Affect an Already Volatile Disaster Climate in South Asia

Natural hazards are no strangers to a majority of South Asians. The region is periodically afflicted by inundated deltas, parched plains, flooded urban sprawl, severe droughts, cyclone-hit crops and eroding beaches and riverbanks. South Asia experiences every conceivable weather related disaster. The region is also a melting pot of poverty, wars, accidents and other natural and man-made hazards that leave the lives, homes and livelihoods of many of its two billion people regularly at risk. Climate change is now adding significant additional risks to this already volatile disaster situation. The signs are everywhere - in the retreating Himalayan glaciers, the sinking coral islands of the Maldives and drought-devastated farming lands across the Indian sub-continent. Climate change, born of warming land, sea and atmosphere, is primed to exacerbate current trends in floods, droughts and cyclones and introduce new, hitherto unknown challenges to the development paths of every country in the region.

> South Asia recorded 128 natural disaster events between 2006 and 2008. 93% of these were of hydro-meteorological origin. 86 incidences of flooding were reported, with nearly 8000 lives lost. India had by far the highest number of disaster events, but flooding in Bangladesh claimed most lives.
>
> **South Asia Disaster Report 2008**[1]

In 2007, the Inter-Governmental Panel on Climate Change confirmed in its Fourth Assessment Report that geographic distribution, frequency and intensity of regular hazards such as tropical storms, floods and droughts have already significantly increased as a result of climate change. Changes are evident in the amount, intensity, frequency and type of precipitation, which increases the area affected by drought, increases number of floods and the frequency and intensity of tropical storms. Sadly the impacts of such climatic variability will be felt most in developing countries. South Asia, already highly susceptible to natural disasters, is primed to suffer disproportionately as the atmosphere heats up. Climate and weather-related disasters already affect croplands, livestock, homes and assets, food security and access to services, transport and communication. It reduces economic opportunity and increases poverty. Poor women and men bear the brunt of natural disasters and stand at the frontline of climate change.

Women in poor communities are disproportionately vulnerable to climate change. Limited access to resources and decision-making processes prevents many women in the region to use their knowledge and experience to respond effectively to the impacts of climate change. Increasing scarcity of water and reductions in biomass and crops puts further pressure on women, as securing water, food and energy for cooking and heating are largely deemed to be women's responsibilities. Past experience has also shown that poor women tend to be disproportionately affected by natural disasters. Climate change adaptation needs to be gender responsive to address these issues and recognise women's expertise in adaptation, mitigation and disaster risk reduction strategies.

South Asians have contributed comparatively little to the total amount of climate change causing greenhouse gas emissions in the atmosphere. The main responsibility for climate change falls on the industrialised North where oil and coal-driven economies and luxury living has led to very high per capita emissions. Poverty and low human development has kept down consumption in South Asia. The region is also home to a significant amount of carbon sinks in its forests. South Asians, in countries with negligible carbon footprints, have unwittingly given up their carbon space to the over-consuming developed world. Rich countries in the North owe the world a huge carbon debt to pay for the impacts of their unmitigated emissions for many decades.

1 Duryog Nivaran & Practical Action, South Asia Disaster Report 2008, Available at: www.duryognivaran.org

Although current per capita emission rates remain low, South Asian economies are growing rapidly, following the same development recipe that created the problem of climate change in the first place. This could well mean that future overall emissions from these countries, especially India, could rise significantly. Climate change mitigation is therefore a challenge for South Asia as well as for the developed North. The region needs to ensure that over half a billion poor people achieve satisfactory levels of human development without choking up an already fragile atmosphere with ever-increasing emissions.

For communities already facing the brunt of these changes, adaptation to climate change is no longer purely of academic interest. In countries like the Maldives global climate change mitigation is a matter of survival. Adaptation options for low lying islands to rising sea levels are extremely limited. Other countries need to assign greater priority within their national planning processes to dealing with the underlying conditions that place certain people at greater risk of natural disasters. Climate variability and its affect on natural hazards leads to recognisable risks that policy makers must take seriously in their long-term development plans. If these escalating risks are ignored in national planning, much of the investment in poverty alleviation and human development to date could be washed away in the stormy waters of climate change.

South Asia is a region where most countries have already spelt out their adaptation needs and their capacity to absorb technology to support these. Many countries in the region are also taking a serious view of reducing disaster risk and some countries including Bangladesh, India and the Maldives have assigned the subject to important frontline ministries.

South Asia is well placed to move to an environmentally sustainable development path. The recipe for sustainable living and low consumption that is now advocated in the North as a new solution for climate change mitigation has been part of the cultural and religious norms of many communities in the region. An alternative, low-carbon development path is therefore not alien to the region.

South Asia can lead the way and demonstrate to the world how positive action could strengthen community resilience, improve human development and support communities to adapt to future climatic uncertainty. The region represents a mixture of political and economic scenarios as it included least developed, middle income and fast industrialising countries like India. Due to its geographic diversity, South Asia is affected by all the problems, risks and challenges of dealing with an uncertain climatic future. If South Asian countries are adequately supported to demonstrate climate change adaptation, low-carbon development and innovative technology to suit local conditions, the region could be an example to the rest of the world. Instead of following in the polluting footsteps of the North, South Asia has the opportunity to rethink its development path and consumption patterns and question the dominant measure of GDP growth as the only indicator of success. The region could pilot policies that favour environmentally sustainable lifestyles, equitable distribution of the essentials for long and fulfilling lives and, ultimately, the well being and happiness of its women and men.[2] On the other hand, if South Asia fails to adapt and adopt an alternate development trajectory, it might spell doom for a world trying to deal with climate change.

2 Bhutan and Sri Lanka have begun to define growth and development in alternate terms. Bhutan has developed a measurement for gross national happiness while Sri Lanka offers a different perspective of human development that takes natural resources and their conservation into consideration.

Climate Change: Amplifying Disaster Risk

All South Asian countries are disaster prone. Drought affects Afghanistan, India, Pakistan and parts of Nepal and Sri Lanka. Floods regularly plague Bangladesh, India, Nepal, and Sri Lanka. Cyclones hit Bangladesh, India and Sri Lanka. Landslides occur in mountainous regions of India, Pakistan, Nepal, Bhutan and Sri Lanka. The Maldives, Bangladesh and Sri Lanka are subject to coastal erosion and salinity intrusion. Climate change is expected to aggravate the frequency and distribution of all these disasters. Much of South Asia relies on monsoon rains to meet its water requirement for human consumption and agriculture. The monsoon carries over 70% of the region's annual precipitation in a four-month period. Variations in the onset, volume and distribution of monsoon rains due to climate change can cause widespread suffering.

South Asia's disaster risk is further enhanced through inappropriate policies and the focus on economic growth over sustainable development, often at the expense of the poor and marginalised. Maldevelopment, high poverty rates, gender inequality and over-populated urban centres contribute to vulnerability, place additional pressure on at-risk communities and add to the burden of South Asian governments that need to protect these communities and their assets from disasters exacerbated by climate change.

Risk-prone Region

In its recent Global Assessment Report (GAR) the UN International Strategy for Disaster Reduction (UNISDR) published a risk model that assesses a country's exposure to natural disasters in terms of mortality (based on historical data and known vulnerability information) and economic losses. A risk classification of 10 points signifies extreme mortality risk. All South Asian countries are positioned above 5, with Maldives assigned an unknown classification. Bangladesh and India are classified as 9 (major risk) Pakistan and Afghanistan as 8 (very high risk), Nepal and Bhutan as 6 and Sri Lanka as 5 (medium risk).

Country	Potential CC Impacts on Natural Disaster Scenario	Multiple mortality risk class 0-10 (ISDR 2009)
Afghanistan	Increased drought, glacial melt, flash floods, landslides	8
Bangladesh	Cyclones and storm surges, reduction of mangroves extent due to salinity- loss of natural barrier, heavier flooding leading to more crop loss and displacement, inundation of low lying coastal areas	9
Bhutan	Glacial lake outburst floods, increased drought episodes, landslides	6
India	Longer periods of drought, heavy rainfall leading to flash floods, increased cyclones in the Bay of Bengal, inundation of low lying coastal areas, glacial melt	9
Maldives	Sea erosion, inundation of islands with people and infrastructure, storm surges, long drought periods affecting drinking water supplies	n/a
Nepal	Glacial melt, reduced river flows impacting downstream water availability, landslides, floods and mudslides, Glacial Lake Outburst Floods	6
Pakistan	Increased drought, flash floods, glacial melt, reduced river flows, inundation of low-lying coastal areas	8
Sri Lanka	Increased drought, flash floods, increased cyclones in the Bay of Bengal , landslides, inundation of low-lying coastal areas	5

New Threats and Increased Exposure

South Asia now faces new, hitherto unfamiliar climate-related threats. Rapid sea level rise could wipe out the Maldives and submerge coastal areas in Sri Lanka, India and Bangladesh. Glacial Lake Outburst Floods (GLOF) in the Himalayan region caused by melt-water breaching glacial barriers that protect highland lakes and retreating glaciers pose further far-reaching challenges; The Himalayan system influences monsoon dynamics, acts as a reservoir to sustain crops, provides groundwater recharge, and is home to a unique ecosystem with many endemic species. With rising temperatures, the ice mass of the Himalayas and Hindu Kush is retreating faster than the global average, threatening water supplies, people's lives, and the region's development.

Climate change will not just impact the frequency and intensity of natural disasters. The Intergovernmental Panel on Climate Change offers the following summary of vulnerabilities of key sectors in the South Asian region, reporting on both the degree of vulnerability and the level of confidence.[3] South Asia has the highest number of highly vulnerable sectors in all seven sub-sectors, including food security, land degradation and human health. All these eventually affect human development and poverty levels. In turn, vulnerability due to poverty is enhanced by the concurrent impacts of climate change.

Climate change will impact on both hazards (by altering patterns, frequency and intensity) and conditions of vulnerability (by affecting health, food security, infrastructure and land). If risk is a combination of hazard and vulnerability, compounded by poor governance and mal-development, climate change will influence the entire equation by amplifying both the nature of hazards and the degree of vulnerability of poor communities.

Food and Fibre	Biodiversity	Water resource	Coastal ecosystem	Human health	Settlements	Land degradation
-2/H	-2/H	-2/H	-2/H	-2/M	-1/M	-2/H

Vulnerability

-2	Highly vulnerable
-1	Moderately vulnerable
0	Slighlty / not vulnerable
+1	Moderately resilient
+2	Most resilient

Level of Confidence

VH	Very High
H	High
M	Medium
L	Low
VL	Very Low

3 Pachauri, R.K and Reisinger, A. (eds.) *Climate Change 2007: Synthesis Report*, IPCC, Geneva, Switzerland, 2007

Poverty and Growth

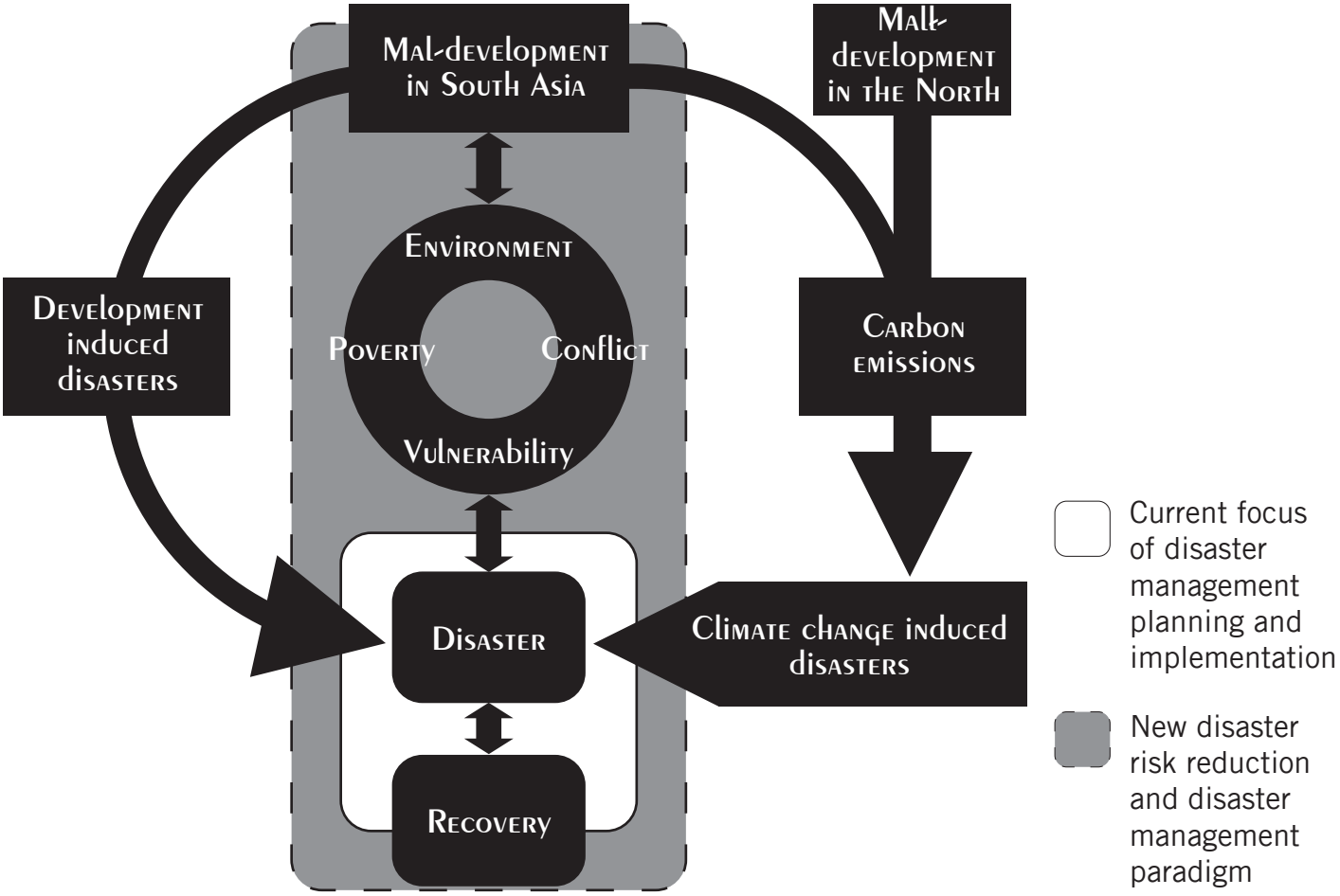
Despite its substantial rate of economic growth, much of South Asia remains poor and under-developed. Of the eight South Asian countries, five (Afghanistan, Bangladesh, Bhutan, Maldives and Nepal) are least developed and two (Maldives and Sri Lanka) are island states. In middle-income or fast industrialising countries like India, Sri Lanka and Pakistan there remain wide gaps in the distribution of wealth and human development.

Across the region, over 70% of its 1.5 billion people live in poverty, the vast majority in rural, agricultural areas. South Asia also has the biggest urban slum population in the world, many of which are regularly exposed to natural disasters. Both urban and rural poor are exposed to a multitude of disasters. The poorer the community, the greater their struggle to withstand and emerge from the debilitating impact of a climate-related disasters. Poor women and men also have less adaptive capacity to face unseasonal weather patterns such as a delayed or failed monsoon rains that may affect their subsistence level livelihoods. With climate change, droughts, floods and cyclones have become more frequent, more intense and more difficult to predict. This has intensified risk for already disaster-prone communities and affects their ability to cope with, and recoup after, disaster events. The spiral of poverty and disaster risk is worsened by climate change and will increasingly stand in the way of achieving the Millennium Development Goals in every South Asian country.

To make matters worse, the development model pursued by almost every South Asian country is premised on a faulty recipe that exacerbates the vulnerability of the poor. Industrialisation, the growth of cities, ill-planned infrastructure development, and industrial agriculture that does away with traditional labour intensive technologies and have led to larger income disparities, unemployment, high poverty and a larger percentage of the population facing elevated levels of risk.

Development or mal-development has resulted in greater exposure of the populations to hazards instead of improving community-level resilience. South Asia's much celebrated economic growth rates have not prevented the accumulation of disaster risks. Good governance in the form of long term policies that address root causes of vulnerability and create conditions that reduce the risks of women and men in exposed communities is essential to counter the impacts of climate change.

Many South Asians have also become poorer as a result of development. The South Asia Disaster Report (SADR) 2008 argued that the benefits of South Asia's high economic growth have accumulated in the hands of a few privileged individuals and have failed to trickle down to the poor. Instead, poverty has escalated, resulting in increased vulnerability to natural hazards. At the same time mal-development has introduced new hazards and risks. Climate change is fast becoming the biggest source of mal-development induced disasters.



Exclusionary development in South Asia has led to top down governance systems that treat disasters separately from development even though disaster risk is often caused or exacerbated by mal-development. Current disaster management planning and implementation focuses largely on the actual disasters and recovery efforts without addressing the root causes. This approach has not helped to significantly reduce disaster risk in the past and it will not help to reduce the fast-growing hazards caused by climate change.

A new paradigm is needed to address disaster risk reduction in South Asia to eliminate or reduce mal-development induced disaster risk and turn development into an opportunity to reduce disaster risk instead. As argued in the SADR 2008, this new paradigm needs to be inclusive, plural and participatory. National planning must address mal-development and envision sustainable development as well as poverty and vulnerability reduction holistically to reduce disaster risk. None of these issues can be effectively addressed in isolation.

This position becomes even more significant when climate change risk is added to the equation. Top-down development policies can certainly improve the ability of poor women and men to cope with intensified risk. However bottom-up approaches must play a vital role. They can empower people to better understand and face local risks that are no longer completely predictable due to the nature of climate change.

Current climate change discussions focus on mitigation, adaptation, technology transfer and finance: Who does what and how, who gets how much and in what form. While these discussions are of immense importance, they need to be supplemented by an urgent shift in the current development paradigm. Poor women and men in South Asia will not be able to face disaster risks posed by development if it continues as usual. Business as usual, even in the short run, will cause major devastation in the region.

Communities at the Frontlines

The majority of South Asians are engaged in subsistence or small-scale commercial agriculture, livestock rearing, forestry, fisheries or hunting. All these livelihoods are threatened by regular disasters many of which are exacerbated by climate change. Longer and more severe droughts, landslides, cyclones, coastal erosion and flooding due to changing rainfall patterns, glacial melt or sea level rise increasingly threaten traditional livelihoods and impact adversely upon food security.

> Almost a quarter of India's land area is prone to drought, which means the annual rainfall is below 60 centimetres. Drought is linked closely to the south-west monsoon and its variability. Late onset, failure or a reduced intensity of the monsoon are all contributing factors. The most affected communities are marginal farmers dependent on rain-fed agriculture. India, with 16% of the global population has only four percent of the global supply of fresh water.
> **India's Initial National Communication to the UNFCCC, 2004**

While all agricultural communities face greater risk as the climate becomes hotter, rain-fed agriculture is particularly vulnerable. Drought is responsible for much of the chronic poverty among pastoralists and farmers engaging in rain fed agriculture. It affects large swathes of India, Pakistan, Afghanistan and smaller sections of Nepal and Sri Lanka.

On the other side of the coin, some communities are facing the threat of increased flash flooding. People living in river deltas, low-lying mega cities and communities living downstream of threatened glaciers are all at risk of sudden floods brought on or intensified by climate change. A large part of Bangladesh is at risk from flooding by monsoon swelled rivers or storm surges along the coast. River bank erosion has also become a critical issue in Bangladesh, as most of the country's productive lands have disappeared. Many areas in India are exposed to similar threat.

In South Asia's mountain regions, glaciers are already retreating and snow lines continually receding. The gradual disappearance of glacial snow, the source of many large rivers in the sub-continent, could spell disaster not just for the Himalayan region but also for downstream countries like India, Pakistan, and Bangladesh. Receding coastlines and an increase in soil salinity is altering the socio-physical character of the highly populated and productive coastal settlements all over South Asia. A large number of the people residing in coastal zones are directly dependent on the natural resource bases of coastal ecosystems. Coastal communities already face climate induced extreme weather threats such as increased exposure to cyclones and tropical storms. Warming of seas also impacts on fish catch of near coast and brackish water fishers. The cumulative impact of the loss of coastline, productive near-coastal lands and increased exposure to cyclones in the Bay of Bengal could have significant economic impacts for the entire region.

Sea level rise is a serious threat not only to small islands but also to the densely populated mega cities such as Dhaka, Karachi, Mumbai and Kolkota, home to over 8 million people each. Experts predict that a third of Bangladesh's coastline could be flooded if the Bay of Bengal rises by one metre, displacing up to 20 million Bangladeshis.[4]

4 Government of Bangladesh, *National Adaptation Plan of Action* (2005)

According to recent research, sea level rise might exceed the IPCC's worst case scenario of 59cm in the next 100 years. Scientists surmise that along the coastline of Bangladesh, India and Pakistan around 130 million people are at risk of being climate refugees.[5] These people live in the Low Elevation Coastal Zone (LECZ) below 10m and are distributed as shown in the table below.

	Area of LECZ	Population in LECZ	Urban Population in LECZ	Fraction of Urban Population in LECZ in Cities Exceeding 5 Million
Bangladesh	54,461	65,524,048	15,428,668	33%
India	81,805	63,188,208	31,515,286	58%
Pakistan	22,197	4,157,045	2,227,118	92%
Sri Lanka	5,536	2,231,097	961,977	0%

Table 1. Summary of Low Elevation Coastal Zone (LECZ) Statistics for Four Countries in South Asia ***(Source: sedac.ciesin.org)***

Together, the Maldives and Bangladesh and parts of India and Sri Lanka will generate the first flood of the region's climate refugees who, at present, have no legal international status, and are thus denied the normal avenues of redress that are currently available to political, or war-related refugees.

Sinking Maldives

With a land area of only 235 square kilometres, the Republic of Maldives is the sixth smallest sovereign nation in terms of land mass. The Maldives are spread out over 1192 island of which over 90 percent are less than one square kilometre in size, and 80% are under one metre in elevation. The projected IPCC worst case scenario would submerge the entire country. To make matters worse, observed trends for sea level rise in the Maldives is much higher than the global average. This significantly increases the risk level for its 300,000 population, most of whom live within 100 m of the coast. Already severe beach erosion is reported from almost every inhabited island. The country's main economic activities, tourism and fishery are both extremely vulnerable to global warming related sea-level rise.

5 Byravan, Sujatha and Rajan, Sudhir Chella, *The Social Impacts of Climate Change in South* Asia (March 1, 2008). Available at SSRN: http://ssrn.com/abstract=1129346

GLOF: a new and terrifying threat

Himalayan countries like Bhutan and Nepal and parts of India, Pakistan face the threat of Glacial Lake Outburst Floods (GLOF). An expert study has identified 2,315 glacial lakes at an altitude above 3,500 m. Up to now, 15 GLOF events have been recorded in Nepal. Climate change induced glacial melting is responsible for the expansion of these glacial lakes as well as the formation of new ones and intensifies the danger of GLOF. Some 20 glacial lakes in Nepal have a high potential for GLOF. Studies show that these floods can be catastrophic and damages unprecedented. The damage by a single GLOF in Sunkoshi Valley in 1981 was US$ 3 million. Similarly, the estimated loss from the Dig Tsho GLOF to the nearly completed Namche Hydropower alone was US$ 1.5 million. This event damaged 14 bridges and a lot of cultivated land. Most devastatingly, it also cost many lives. If the frequency and intensity of GLOF increases due to climate change, Nepal is going to face even larger impacts in future.

Nepal Country Report. South Asia Disaster Report 2008

Poor communities in South Asia have always been at the forefront of disaster. Poverty and restricted livelihood options have driven people to settle in marginal and risk-prone locations. This has in turn led to further deterioration of these areas and increased risk exposure. Development approaches adopted in the region have exacerbated this situation[6].

At the same time, poor women and men have developed their own coping strategies by understanding many of the risks they were periodically exposed to. Climate change aggravates the plight of those who were already in situations of unimaginable poverty and vulnerability. It also minimises their ability predict risk in order to cope and survive.

South Asia's poor are already experiencing drastic and sudden impacts due to the increased frequency and intensity of climate change related disasters. Many are struggling to understand how to interpret these changes in order to improve their conventional survival strategies, although few realise, or have access to knowledge about, the long-term gravity of the issue.

Poor people in South Asia need resources to cope with this emerging disaster scenario. Practical Action promotes the building of adaptive capacity and resilience within local communities as an important strategy to respond to increasingly unpredictable disaster risks. Developing sound human and social capital is crucial for this.

The 2008 SADR notes that even though most South Asian countries are amongst the bottom quartile in the Human Development Index, South Asian governments spend little on the development of human and social capital. South Asian governments as well as international and regional financial institutions continue to promote conventional development models. A major shift in governance is needed in the region to effectively handle the new challenges posed by climate change.

6 Duryog Nivaran & Practical Action, *South Asia Disaster Report 2008*, Available at: www.duryognivaran.org

Adaptation: Who Will Foot the Bill?

Three South Asian countries, Bangladesh, Bhutan and the Maldives, have submitted their National Adaptation Programmes of Action (NAPAs) to the United Nations Framework Convention on Climate Change (UNFCCC). Each plan details the respective country's most urgent adaptation needs and estimated costs. A large number of concrete actions identified in these plans are directly related to disaster management. Of the 15 priority actions listed in Bangladesh's NAPA, nine are directly related to managing the impact of natural disasters. These actions include emergency preparedness such as flood shelters, crop insurance, adapting to increased salinity, and protection of infrastructure and food crops against flash flooding. Both Nepal and Bhutan have identified GLOF as a priority that needs urgent focus. In Bhutan's recently prepared NAPA six priority projects have been identified and costed. All of these are directly related to managing the increased threat of natural disasters. Four actions are related to managing GLOF, including the artificial lowering of the most dangerous glacial lakes. In their separate communications to the UNFCCC, India and Sri Lanka have also placed emphasis on tackling climate-related disasters such as flood and drought.

The Maldives places its bets on its *Safer Island Strategy*, which involves trials of new, innovative technologies for coastal protection to safeguard population and infrastructure of five of the most populous islands. The Maldives is the only country in the region which has consciously mainstreamed disaster risk reduction and climate change adaptation into the process of national planning. Bangladesh has come close by assigning disaster management to its high-powered Ministry of Food and Agriculture in a move to merge the poverty reduction efforts with better disaster management. Unfortunately, climate change adaptation is assigned to a separate Ministry, which keeps these issues areas apart and complicates holistic planning efforts. In other South Asian nations the development discourse has not fully embraced the links between climate change adaptation, disaster risk reduction and poverty eradication.

Least developed countries that have submitted NAPAs expected external financing from global funds to implement their prioritised actions. To date, very few of these concrete actions have received any funding for implementation. Bangladesh and Bhutan secured some funding under the Global Environment Facility's (GEF) Least Developed Country Fund (LDCF). This fund was set up with voluntary contributions from developed countries. Implementation of the priority actions in all NAPAs requires at least half a

billion dollars, but GEF has been able to raise little over a quarter in commitments ($172 million) and disbursed just $57 million. The Adaptation Fund, currently the only active fund, was born very late at the United Nations' Climate Conference in Bali in 2007 and is funded through a mechanism of 2% levy on CDM projects, which is wholly inadequate and places no additional burden upon those who are primarily responsible for the impacts of climate change.[7]

The Maldivian Government is particularly vocal of its disappointment with the international community and particularly with the developed North for its lack of commitment towards funding the country's prioritised adaptation actions. The country urgently seeks assistance to implement its *Safer Island Strategy*. The total cost of this project including technology transfer and capacity building is under US$ 35 million but the country, which submitted the NAPA in 2006, is yet to be supported even partially to implement its priority risk management measures.

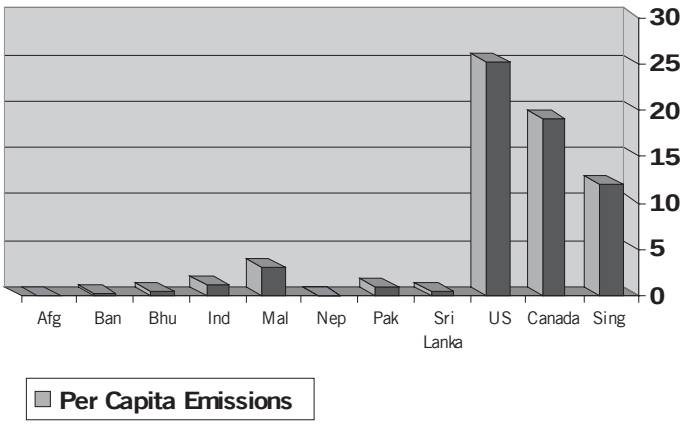
Countries that contributed least to climate change are likely to suffer its impacts disproportionately. These countries require extra and specific financial help to deal with climate change. Using existing development funds for adaptation is unjust as it forces those who contributed little to the impacts of climate change to sacrifice their right to development in order to adapt to these impacts.

Adaptation funding is not a question of aid, but a matter of compensation for damages and prevention of worse future impacts. Adaptation funds should therefore be additional to existing Official Development Assistance (ODA) targets. Adapting to climate change is a long-term process for developing countries. Unreliable and unsustainable funding levels will jeopardise their adaptation efforts. Timely and reliable adaptation funds could well mean the difference between life and death for many South Asians living in disaster-prone areas.

7 The Clean Development Mechanism of the Kyoto Protocol is the UNFCCC's portal to trade carbon credits between developed and developing countries.

Mitigation: Obligation or Threat to Human Development?

Of all South Asian countries, only India is a significant overall emitter of greenhouse gases. Even in India, the per capita emissions are much lower than those of developed countries. Despite its phenomenal growth in the past two decades, India still has around 300 million very poor people who require a greater level of human development to reach a satisfactory quality of life. Every country in the region has to commit a sizeable portion of their budgets to battle poverty.



Per capita emissions (tonnes of CO2/per year/ per person) are very inequitably distributed. The carbon fuelled growth of rich countries has greatly encroached upon the available global carbon space and have made it impossible for poorer countries to follow the same model of development.

The emerging consensus that global warming must be limited well below the level of 2°C above pre-industrial levels to avoid the worst impacts of climate change calls for global emission reductions on the order of 80% below 1990 levels by 2050. This sets ambitious but achievable targets for mitigation. The onus of mitigation lies with the developed countries of the North. To ensure long-term climatic stability, the North has to seriously curb its excesses. Based on its historic and present responsibility for emission, the North has to reduce its emissions by at least 40% below 1990 levels by 2020 to achieve a high probability of limiting global temperature rise below 2°C. Time is running out. The international community needs to agree on binding targets and penalties imposed on developed countries to reduce their greenhouse gas emissions and mainstream low-carbon development.

As the region strives to meet its development goals, undoubtedly its share of greenhouse gas emissions will increase in the short term. This is especially true of emerging regional industrial giants like India, and fast developing economies like Bangladesh and Sri Lanka. However, the current concentrations of greenhouse gases in the atmosphere means that developing countries will need to adopt nationally appropriate mitigation actions. Their efforts to limit domestic emission growth need to be supported by international finance allowing for substantial reductions below business as usual. Any agreement in Copenhagen should take serious note of ensuring equitable access to modern, low-carbon technology between and within countries.

All developing countries should be supported financially and technologically to develop strategies for reducing emissions in a way that does not impede on their human development goals or poverty reduction targets. Increased human development and income generation among the poor is an important measure for reducing disaster risk and supporting adaptive capacity of communities at the frontlines. This goal needs to be foremost in mind when imposing targets for low-carbon development upon Southern countries. A wide range of adaptation technologies that can reduce disaster risk for vulnerable communities is already available. In addition, technologies for early warning of different climate-induced extreme weather events also play an important role in disaster risk reduction.

A Selection of Technologies for Adaptation and Disaster Risk Reduction

Category	Technologies for adaptation
Coastal zones	Restoration of coastal forests and coral reefs, monitoring coastal and coral erosion, sand dune restoration and construction, dykes, dams, levees, nets and dredging, community based conservation programmes and aquaculture, sea walls, revetments saltwater intrusion barriers, tidal barriers
Early warning and forecasting	Agriculture and food security management system, natural disaster response systems, improved weather forecasting, early warning systems for floods and droughts, improved data gathering, improved hydrometeorological networks, improved communication systems, early warning system for desertification etc
Infrastructure	Improved technical design and construction, changes in roofing material, improved levee construction, establishment of building codes, windmills, improved planning, use of local non-metallic construction material, construction of water gates, rehabilitation of multiple use reservoirs, implementation of communications infrastructure and rehabilitation and reconstruction of meteorological/climate stations
Terrestrial ecosystems	Afforestation, replanting and improved silviculture, watershed restoration and management, flood zone restoration and creation, protection and rehabilitation of degraded soil and lands, forest and brush fire prevention methods, promotion of ago-farming and forestry in semi-arid landscapes, lake training and eradication of invasive flora species
Water resources	Water harvesting, spate irrigation, control of sand encroachment, small scale irrigation and harvesting for arid areas, gravity irrigation systems, maintenance and construction of reservoirs and wells, capture of water run-off, drip irrigation, installation and maintenance of water pumps groundwater recharge of wells, wastewater treatment etc
Agriculture, livestock and fisheries	soil conservation and land improvement, coastal zone protection, changing cultivars and crop varieties, improved water distribution networks, improving cultivation practices, crop rotation, bench terracing and contour cropping, construction of windbreaks, integrated pest management, dry farming, diversity and improve aquaculture, food processing and preservation, development, use and promotion of drought- and heat- resistant crops, and improved quality of fishery-related data, installation of Device for Fish Concentration (DFC) on costal zones, new navigation technologies for fishing, networks of early warning systems, promotion of new rice varieties and agricultural forecast modelling etc

Source: UNFCCC/SBSTA (2009)

South Asia: Urgent Response and Long Term Promise

International forums debating the way forward for the world have so far had very little implications on the day-to-day lives of South Asians. Many of them are already battling the impacts of global warming in their fields, villages and cities, facing the daily vagaries of climate related hazards without sufficient coping capacity. International negotiations on climate change need to consider and support these people in their efforts to overcome climatic stresses.

South Asia's culture of sustainable development and low consumption can be harnessed to drive regional development along a low-carbon route. Nonetheless, South Asian countries, facing a host of climate change related disasters in addition to the challenges of increasing human development and eradicating poverty, need the support of those who bear the greatest historic and present responsibility for the impacts of climate change:

- Northern countries are responsible for the vast majority of historic and present emissions and need to bear the bulk of mitigation actions. Ambitious emission reduction targets based on the latest science are imperative to keep warming well below 2 degrees in order to significantly slow the increase in climate change related disaster risks in South Asia.[8] This is also essential to prevent catastrophes that cannot be addressed by adaptation measures such as the potential disappearance of the Maldives.

- South Asian countries also need support in implementing the priority actions identified in their National Adaptation Programmes. Adaptation efforts need to prioritise the poorest and most vulnerable communities. National governments need to be supported to look beyond short-term socio-political issues within and between countries and enable them to adopt development plans with long-term sustainable development goals.

- South Asian countries need have access to modern, low carbon technologies for climate adaptation and mitigation. This includes creating effective ways of sharing information about existing technologies and removing barriers including Intellectual Property Rights that prevent the transfer of these technologies. Procedures are also needed to ensure that at-risk communities have access to technologies to assist their adaptation. Local technology development addressing climate change and sustainable development need to be valued and enhanced. This will also assist in developing South Asia's human resources and capacity.

- The international community needs to agree on financial mechanisms for the generation of sufficient, predictable and sustainable funding for adaptation and mitigation efforts and technologies. Funding institutions should have major representation by southern countries. Any assistance should not be a part of regular Official Development Assistance (ODA) commitments but part of a new post-Copenhagen agreement. Funds for developing countries adaptation and mitigation needs need to be additional to their ODA targets of 0.7% of GDP, and delivered as grants not loans. Conditions linked to ODA and loans from international financial institutions should not worsen the impacts of climate change through mal-development or excessive carbon emissions as has happened the past.

A strong, fair and legally binding outcome is needed from the Copenhagen United Nations Climate Change Conference to reduce the frequency and intensity of present and future climate change induced disasters and enable the region to adapt to the impacts of climate change.

8 Climate Action Network International, *Fair, Ambitious & Binding, Essentials for a successful climate deal* (December 1, 2009) Available at: http://climatenetwork.org/climate-change-basics/CAN_FAB_Essentials.pdf

For Regional Policy Makers - A Time to Rethink

Disaster risk reduction and climate change adaptation need to be prominently integrated in all national planning processes. While the strategic thinking in South Asia regarding disaster risk reduction has been initiated and institutional arrangements are being implemented, the reality on the ground is far from satisfactory. Risk levels and exposure are increasing due to ill-managed development and growth of populous centres in vulnerable locations. A review of root causes reveals some pertinent issues:

- Lack of development and implementation of disaster and climate risk reduction activities as a function of everyday governance
- Lack of planning, tools and funding to translate already identified adaptation and disaster risk reduction measures into demonstrable initiatives that make a real difference on the ground
- Lack of political and bureaucratic will, skill and resources to mainstream adaptation and disaster risk reduction fully into development planning.

Therefore the region's policy makers, planners and climate negotiators need to:

1. Ensure good governance in development and disaster risk reduction activities at all levels. Adaption cannot work in isolation. National adaptation programs must be an integral part of development as a whole. South Asia should not be satisfied with adaptation structures that aim to simply return the disaster risk scenario to a pre-climate change level. Adaptation needs to be integrated at a very high level of government planning in order to ensure low-risk, equitable human development and poverty alleviation

2. Prepare countries for a low-carbon future by looking inward at culturally acceptable models learning from traditional and holistic lifestyles that ensure human development, dignity and environmental protection. South Asia's development approach needs to make sense locally in order to reduce poverty and vulnerability. Both short and long-term measures are required to shift towards a better model of governance. Traditional governance systems with devolved and participatory decision making by women and men, capacity enhancement, respect for the environment and a cautious approach to consumption can serve as a template for addressing the new challenges

3. Develop, seek, adopt and share environmentally sound technologies to skip the traditional development trajectory and allow for faster transition to a modern, low carbon society.

4. Lobby for a climate adaptation financing framework that is external and additional to regular ODA targets and a mechanism for technology transfer that allows southern countries to decide on access, priorities and time frames

5. Place additional pressure on Northern countries to agree to legally binding targets on emission reductions based on the latest science to prevent catastrophic climate change.

About Us:

Practical Action

Practical Action was founded in United Kingdom by Fritz Schumacher, author of the book "Small is Beautiful". The organisation works on appropriate technologies and poverty reduction to help poor women and men to a) reduce vulnerability b) engage in markets c) access infrastructure services and d) understand threats and be able to take advantage of opportunities posed by new technologies. The regional programme of Practical Action (India, Pakistan, Sri Lanka) has been in operation since the 1970s and is an active member of the Climate Action Network South Asia (CANSA) and the Sri Lankan government's National Advisory Committee on Climate Change. The organisation is also a leading member of the National Disaster Management Coordination Committee and one of the principle input providers for the disaster risk reduction working group in Sri Lanka.