The Impact of Climate Change in the Least Developed Countries

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"We have been sustained by the ocean for two million years, and it has been bountiful and continues to yield to us its bounty. We have now learned that this harmony could be interrupted by the actions of nations very distant from our shores… We, the people's of the South Pacific Region, appeal to you in a common voice, the voice of those who may become the first victims of global warming… to ensure the survival of our cultures and our very existence and to prevent us from becoming 'endangered species' or the dinosaurs of the next century…"

- Ernest Beni, Vanuatu's principal delegate, addressing the IPCC Response Strategies Working Group, Geneva, October 1989.[1]

Context

Much discussion and debate are going on around the issue of Climate Change. Why so much commotion and despair about it? Because it has resulted from unprecedented economic growth, but at very high social and environmental costs. When economic growth and prosperity in one part of the planet affects the livelihoods of the peoples in other parts and thereby threatens the fabric of human relations to nature, it becomes a serious concern for all. We must address this issue in its totality. In this discussion, climate change, natural resources, sustainable development and equity and justice need to be discussed together, as they are inter-linked.

Natural Resources

Some resources occur naturally within environments. Natural resource is often characterized by amounts of biodiversity existent in various ecosystems. These are mainly of two types.

- Biotic: Biotic resources are obtained from the biosphere, such as forests, animals, birds, fish and other marine organisms. Mineral fuels, such as coal and petroleum, are also included in this category because they are formed from decayed organic matter.
- Abiotic: Abiotic resources include non-living things including land, water, air and ores (such as gold, iron, copper, silver, etc).

These together define the ecosystem that refers to the combined physical and biological components of an environment. An ecosystem is generally an area within the natural environment in which physical (abiotic) factors of the environment function together with interdependent (biotic) organisms within the same habitat to create a harmonious system.

[1] The Greenpeace Report (1990). Global Warming, Oxford University Press.

Natural resources are derived from the environment. Many of these are essential for our survival, while others are used for satisfying our wants. With respect to future use, natural resources are of two types, renewable and non-renewable.

- Renewable resources are those which can be replenished or reproduced easily. Some of these like sunlight, air, wind, etc are continuously available and their quantity is not affected by human consumption. Many renewable resources can be depleted by human use, but may also be replenished, thus maintaining a flow. Some of these like agricultural crops take a short time for renewal; others like water take a comparatively longer time, while still others like forests take even longer.
- Non-renewable resources are formed over very long geological periods. Minerals and fossil fuels are included in this category. Since their rate of formation is extremely slow, they cannot be replenished once they get depleted. The metallic minerals can be re-used by recycling them. But coal and petroleum cannot be recycled.

Sustainable Development

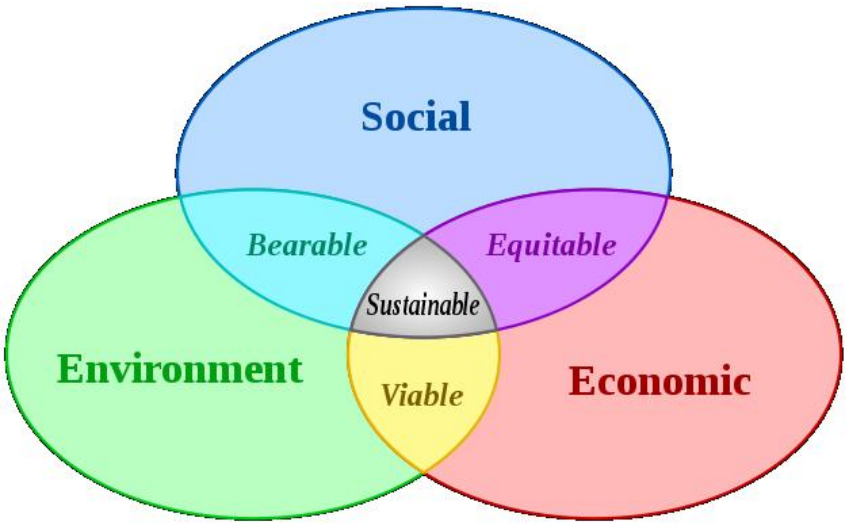
Sustainable development is defined as balancing the fulfillment of human needs with the protection of the natural environment. Report of the Brundtland Commission (Our Common Future, 1987), defined sustainable development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."

The global quest for sustainable development reached a wider dimension about four decades ago and has been further reinforced by subsequent initiatives, such as,

- Stockholm Conference on Human Development (1972);
- The Brundtland Commission, formally the World Commission on Environment and Development (WCED), convened by the United Nations in 1983;
- The UN Conference on Environment and Development, also known as the Rio Summit (Earth Summit) in 1992 (UNFCC, CBD, Earth Charter, Forestry Principles, Agenda 21);
- Commission for Sustainable Development (CSD) established by the UN to ensure effective follow-up to the Rio Summit;
- The World Summit on Sustainable Development (WSSD) or Earth Summit in 2002 and the adoption of the Johannesburg Declaration on Sustainable Development.

Sustainability is an all-encompassing concept for human progress that combines necessary social, economic and environmental aspects. This may be understood with the help of the following Figure (Figure 1)

Figure 1: Sustainable development model



Climate Change

Climate in a conventional context is defined as the average weather (temperature, precipitation, and wind) over 30 years or more. Climate change is a natural phenomenon. But the unprecedented rapid change of climate in recent decades is human induced. The United Nations Framework Convention on Climate Change defines climate change as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods". In the latter sense, climate change is synonymous with global warming.

Increased greenhouse gas (GHG) emission and concentration into the atmosphere following industrial growth and burning of fossil fuel, the planet is becoming warmer and consequently climate is changing. Precipitation pattern and temperature regimes are changing as well.

Climate change is causing increase in catastrophic weather events like flood, drought, cyclone, storm surge, sea level rise, salinity intrusion into the country side, vector-borne disease, loss of biodiversity, change in cropping pattern and health hazard.

Climate Change and Sustainable Development

Climate change threatens the natural and social balance and challenges sustainable development. To overcome challenges and to maintain sustainability, it is necessary to protect our past development gains from increased hazards following climate change and at the same time adjust our development processes considering changing climate parameters.

Discussions and negotiations are going on among different stakeholders how to address the issue of climate change. Consensus has been reached on certain issues and sharp disagreements are observed on many more issues. It is widely agreed by many that urgent attention is needed for the following:

- Stop climate change through stabilizing GHG concentration in the atmosphere (1990 level) in the long term;
- Device, design, develop, pilot and implement adaptation strategies and measures as a medium term intervention;
- Cope with the deteriorating situation reducing disaster risks and increasing resilience of the communities and ecosystems through appropriate interventions.

Adaptation has a limit and ultimate solution is to stabilize GHG in the atmosphere reducing emission and thereby stabilizing climate system.

Equity

Equity is about fairness. It means that there should be a minimum level of income and environmental quality below which nobody falls. Within a community it also means that everyone should have equal access to community resources and opportunities, and that no individual or group of people should be asked to carry a greater environmental burden than the rest of the community as a result of actions taken at the local, national and the global level. It is generally agreed that equity implies a need for fairness (not necessarily equality) in the distribution of gains and losses and the entitlement of everyone to an acceptable quality and standard of living.

Intergenerational equity is an important dimension of equity. The idea behind not reducing the ability of future generations to meet their needs is that, although future generations may gain from economic progress, those gains may be more than offset by environmental deterioration. Most people would acknowledge a moral obligation to future generations, particularly as people who are not yet born can have no say in decisions taken today that may affect them.

There are two different ways of looking at the need to ensure that future generations can supply their needs. One is to view the environment in terms of natural resources or natural capital that is available for wealth creation, and to say that future generations should have the same ability to create wealth as we have. Therefore, future generations will be adequately compensated for any loss of environmental amenity by having alternative sources of wealth creation. This is referred to as ‘weak sustainability’. The other way is to view the environment as offering more than just economic potential that cannot be replaced by human-made wealth and to argue that future generations should not inherit a degraded environment, no matter how many extra sources of wealth are available to them. This is referred to as ‘strong sustainability’.

Equity can also be applied across communities and nations within one generation. The reason that intra-generational equity is a key principle of sustainable development is that inequity is a cause of environmental degradation. Poverty deprives people of the choice about whether or not to be environmentally sound in their activities.

High levels of affluence are perhaps even more damaging to the environment as they are accompanied by high levels of consumption, which lead to resource depletion and waste

accumulation. Many environmental problems, such as global warming and chemical contamination, are results of affluence rather than poverty.

Ecosystems and Poverty

Ecosystem services that keep life on earth going and maintain biodiversity contribute to human welfare. Ecosystems are being degraded because of climate change, adversely affecting human well-being, human security and freedom of choice. Degradation of ecosystems poses a barrier to the advancement of the Millennium Development Goals and to the MDG targets for 2015. Many of the regions facing the greatest challenges in achieving the MDGs overlap with the regions facing the greatest problems related to the sustainable supply of ecosystem services. The regions include sub-Saharan Africa, Central Asia, and parts of South and Southeast Asia, as well as some regions in Latin America. Sub-Saharan Africa has experienced increase in maternal deaths and income poverty (those living on less than $1 a day) and the number of people living in poverty is likely to rise from 315 million in 1999 to 404 million by 2015.[2]

Impact of Climate Change

Although LDCs contribute little to global warming, accounting for less than one percent of the world's total GHG emissions, they will be disproportionately affected by climate change. Along with their economic weaknesses, their geographical location and high dependence on natural resources as a source of livelihoods and national income render them particularly vulnerable to climate change.[3] Estimates show that "for every 1^0 C increase in average global temperatures, annual average growth in poor countries could drop by 2-3 percentage points, with no change in the growth performance of rich countries".[4] Taken together, these estimates for global warming and trends in natural disasters in LDCs show some evidence of the potential linkage between rising world temperatures and the frequency of natural disasters.[5] Despite low emissions of GHG, LDCs are hit by increasing number of disasters (Table 1).[6]

[2] World Resources Institute (2005). Ecosystems and Human Well-Being, Washington, DC.
[3] UN-OHRLLS (2009). The impact of climate change on the development prospects of the least developed countries and small island developing states, New York.
[4] UN-DESA (2009). World Economic and Social Survey 2009, New York.
[5] United Nations (2010). The Least developed Countries Report 2010, New York.
[6] UNCTAD. Statistical Tables on the Lease Developed Countries, 2010.

Table 1: Indicators on environment and natural disasters

Country group	Carbon Dioxide emissions/capita (metric ton)			Forest area (% change)	Number of natural disasters		
	1990	2000	2008	1990-2008	1990	2000	2009
LDCs	0.1	0.1	0.2	-9.4	34	107	89
LDCs: Africa & Haiti	0.1	0.2	0.2	-5.3	16	70	57
LDCs: Asia	0.2	0.2	0.3	-17.2	6	18	11
LDCs: Islands	0.5	0.6	0.7	-7.4	8	29	25
All developing countries	1.6	1.9	3.0	-5.6	168	365	303

Some country level examples from different regions are cited below that explain the plight of the people.

Bangladesh

Incidence of disasters like floods, cyclones and land erosion significantly affects lives and properties of the coastal households. Records of the last 200 years show that at least 70 major cyclones have hit the country. Since 1970, nearly one million people died due to catastrophic cyclones. An analysis based on occurrence of cyclones over a 50-years time interval shows an increasing trend of cyclone occurrence.[7]. Tens of thousands of people are displaced because of cyclones and end up as environmental refugees, crowding in urban slums. Over 106,000 people were displaced due to water logging caused by the recent cyclone *Aila* that hit the Bangladesh coast in 2009.[8]

Ethiopia

Ethiopia is vulnerable to climate change because of its geographic exposure, high incidence of poverty and social inequality. Sura Waqqo (52) is an agro-pastoralist in southern Ethiopia. To him, climate change means increasing incidence of prolonged drought. “It is drought and

[7] PDO-ICZMP (2006), State of the Coast 2006, Water Resources Planning Organization, Bangladesh, Dhaka.
[8] SAAPE (2010). Poverty & Vulnerability Cycles in South Asia, Kathmandu.

disease caused by the lack of God's rain and the change in the wind system. The wind and the burning sun are bringing diseases and illness to our children and cattle. Our trees, which are the sources of our food, medicine and shelter, are dying and toxic weeds and thorny bushes are rapidly invading our grazing areas".[9]

Nepal

Nepal is highly vulnerable to devastation from climate change. Despite its narrow width from north to south, the country spans a remarkably wide altitude range, from slightly above the sea level to the peaks of the Himalayan range. Notwithstanding its negligible contribution to GHG, Nepal's economy and livelihoods could suffer greatly from climate change. Agriculture is heavily dependent on rainfall. Any variations in the hydrological cycle could severely affect its economy and people's livelihoods. Should one of the country's 2,000 glacial lakes burst its banks, the resulting floods could cause havoc downstream.[10]

Senegal

The severest impact of climate change on fishers is the rise in recent years of the phenomenon of migration that has led thousands of young people to give up their activities and they are migrating to Europe by taking all the risks. Some of them transformed their rickety boats to go to the Canary Islands. Women fishers who control the processing sector are being affected by the disappearance of their work centers and habitats. With more men attempting to migrate, situation of these women have become more precarious.[11]

Solomon Islands

Patson Baea (48) has lived all his life on a coral island that is disappearing into the sea. "December is the worst because of the North wind blowing the waves onto the island. The coastline is washing away, two to four feet every year. Tides are getting very high." Baea fears that he and his family may have to leave the island that his parents owned before him. "For me, my life has been on this island, and me, I'd wish to stay on until I'm dead", he says.[12]

Coping with Climate Change

We are now in a state of uncertainty. Many industrialized countries in the North and some emerging economies in the South are resisting climate negotiations in some way or other. "In order to fulfill the principles of equity and common but differentiated responsibilities, the international community needs to allocate responsibility to those who have primarily contributed to the problem for the crisis and recognize the vulnerability of those who have to bear the greatest burden of adjustment to climate change".[13]

Recent proposals to improve the existing burden and cost-sharing mechanisms are contained in the Greenhouse Development Rights Framework and the Responsibility-Capacity (GDRFC) Index. They

[9] LDC Watch (2009). Civil Society Position from the LDCs – Upholding the Spirit of Rights and Justice at the COP 15 in Copenhagen, Kathmandu.
[10] Social Watch (2010). Social Watch Report 2010, Montevideo.
[11] LDC Watch (2009). Op cit.
[12] LDC Watch (2009). Ibid.
[13] United Nations (2010). Op cit.

include mechanisms for allocating responsibility based on a combination of emissions and incomes per capita and entitlements related to global per capita emission targets. Table 2 shows the results of the GDRFC index for LDCs and other groups. Hypothetically, using the indicator to establish contributions to a $250 billion per annum global climate fund in 2010, the LDCs' share would be $0.25 billion, that of Annex 1 countries[14] would be $192.5 billion and non-Annex 1 countries $57.5 billion.[15]

Table 2: Greenhouse development rights (% of global, unless otherwise indicated)

Countries	2010		RCI (Responsibility Capacity Index)		
	Population	GDP/capita (PPP $)	2010	2020	2030
LDCs	11.7	1,274	0.1	0.1	0.1
Annex 1	18.7	30,924	77	69	61
Non-Annex 1	81.3	5,096	23	31	39
High income	15.5	36,488	77	69	61
Middle income	63.3	6,226	22	30	38
Low income	21.2	1,599	0.2	0.3	0.5

Source: Worldwatch Institute (2009). State of the World: Into a Warming World, www.worldwatch.org/node/5984

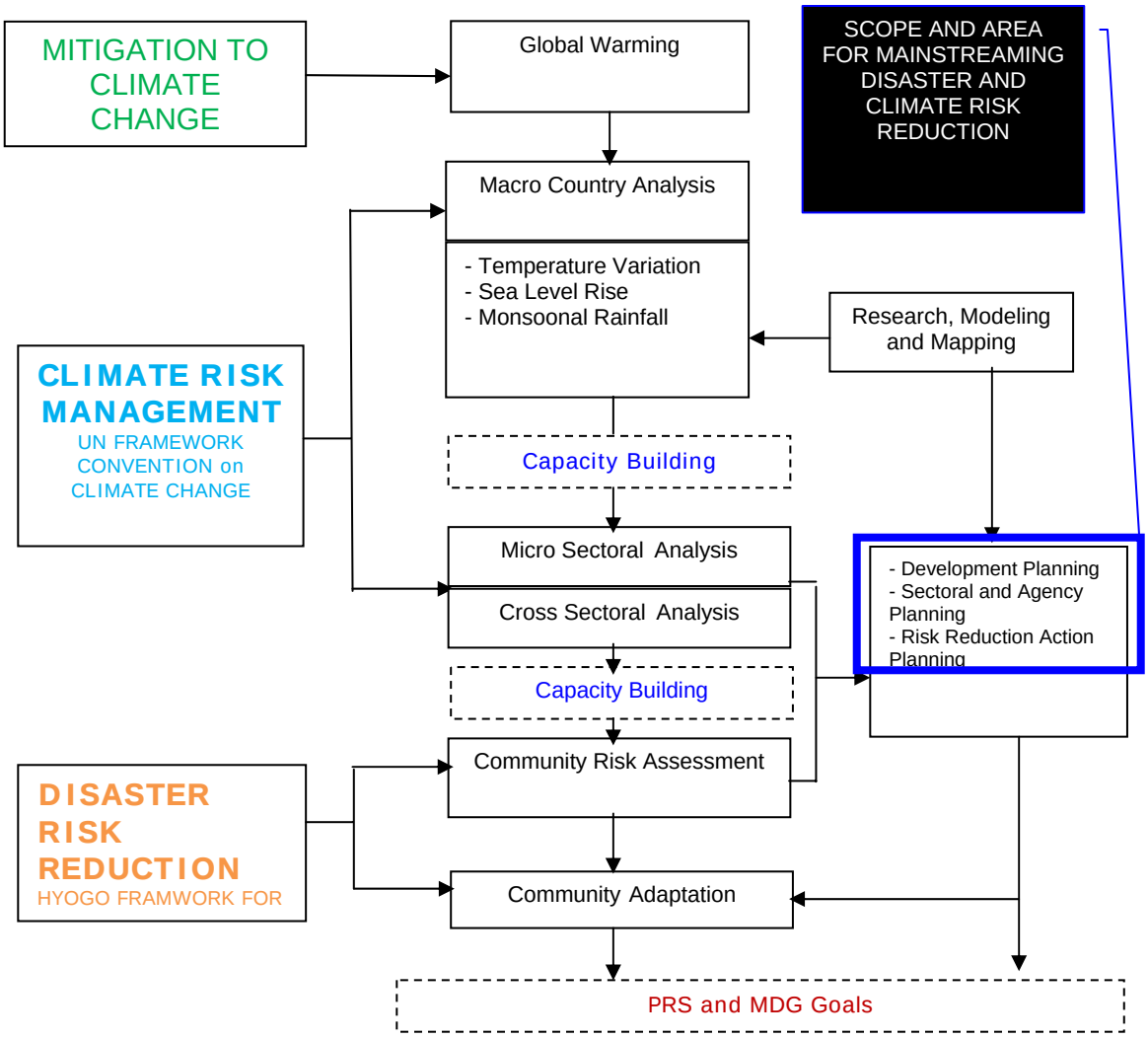
The Copenhagen Accord emerging from the UNFCC's 15th session of the Conference of the Parties (COP) has included pledges to scale up financing for "developing countries" up to $30 billion during 2010-12 for adaptation and mitigation. This amount is far less than the estimates for such financing. There are other commitments to mobilize $100 billion for mitigation measures from a mixture of bilateral and multilateral public and private sources of finance. This does not represent a commitment for financing per se; it merely commits to mobilizing resources. Given the scale of the challenge, it is critical to ensure sufficient financing for international climate adaptation and mitigation and the sustainability and predictability of the financial flows. LDCs are more susceptible to economic shocks due to their structural weaknesses. Their requirements for a stable source of climate-related finance to buffer the unpredictable impacts of climate change and shift to climate-friendly economic investments is therefore more pressing.[16]

While the impoverished countries and their partners in other parts of the world should work together and struggle relentlessly to push forward the agenda of reversing current trend of climate change, at the same time we have to prepare ourselves to cope with impending dangers. One way to cope with climate change is to prepare for Climate Resilient Sustainable Development. This includes defining risk environment, responding to climate change through enabling processes and actions and institutional facilitation.

A Disaster Risk Reduction (DRR) frame may be understood with the help of a model (Figure 2).[17]

[14] Industrialized countries and former economies in transition.
[15] United Nations (2010). Op cit.
[16] United Nations (2010). Ibid.
[17] Ministry of Food and Disaster Management, Government of Bangladesh. National Disaster Management Plan 2010-15.

Figure 2: Disaster Risk Reduction Model



The model suggests certain actions to be taken at the household level. These are:

- Aware and assess household risks;
- Prepare for household level risk reduction and adaptation;
- Prepare to protect homestead from river/sea erosion;
- Raise homestead, tube well;
- Store seeds, essentials (emergency medicine, food, fodder etc.);
- Diversify crop/vegetable/alternate livelihoods;
- Plan/orient to evacuate children, elderly and persons with disability to shelters.

At the community level, following actions are recommended:

- Area based participatory planning for disaster risk reduction and adaptation and implementation;
- Access and disseminate early warning (flood, cyclone, storm etc.) to the community;
- Prepare for recovery arrangement/services;
- Community seed store, seed bed, safety of livelihood tools.

Conclusion

The international community is not moving as per our desire. But we cannot sit idle. We are to push forward our demands that the industrialized countries and some emerging economies must not put our lives in great risk just to acquire and maintain their affluence and high consumption level. At the same time we are to develop our own capacity and mechanisms to deal with the imminent danger forging greater south-south alliance and solidarity between the peoples of the south and the north.