

**Climate change and the
Challenge to Achievement of
Millennium Development Goals
in the Developing Countries.**

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The Science of Climate Change

- Climate change is the change that is brought about due to external forcing, either Human or natural, in weather patterns or in the atmosphere due to change in such variables like atmospheric temperature, rainfall, velocity of wind, water vapour concentration in the air, sea surface temperature, and the concentration and thickness of ice formation in the Oceans.

The Greenhouse Effect

- The rapid change in one or more of these variables is attributed mainly to the activities of human-beings which release gases , commonly known as green house gases that trap the outgoing heat [infrared radiation] from the earth's surface and divert it back to the earth. This causes a rise in surface temperature or what is called 'climate forcing'. Due to this climate forcing the climate changes or warms up after a certain time period according to the climate sensitivity of the Earth.
- The greenhouse gases having an important influence on the earth's climate are: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), water vapor (H₂O), ozone (O₃), and the chlorofluorocarbons.

Climate change, growth and development

- Economic growth in countries across the globe implies more demand for usage of energy and natural resources.
- Population growth implies pressure on land and also water resources leading to deforestation and more withdrawal of freshwater.

Climate change, growth and development

- Increase in energy consumption leads to emission of greenhouse gases in volumes much higher and faster than what Nature can assimilate, thus adding to the problem of climate change.
- This phenomenon can affect the livelihoods and vulnerability of the poor who are not well endowed with the resources to protect themselves from the erratic changes on account of climate change affecting their meager sources of livelihood.

Climate change, growth and development

- Therefore, economic growth needs to be transformed into economic development to give advantage to the less endowed, who constitute a major percentage of the population especially in countries of South Asia region.

Impact of Climate Change: Implications for developing countries

- Water: Increase in surface temperature and change in hydrological cycle will result in change in rainfall patterns over the region. Some areas may experience intense rainfall resulting in heavy floods, while other areas may witness less rainfall and also frequent droughts. An increase in sea surface temperature will affect the El Nino cycle resulting in frequent and unexpected cyclones which would adversely affect the eastern parts India and Bangladesh.

Impact of Climate Change: Implications for developing countries

- *Water quantity as well as water quality can be adversely affected leading to various problems like lack of water intake culminating in dehydration or water-borne diseases like dysentery, diarrhea, etc.*

Impact of Climate Change: Implications for developing countries

- **Agriculture:** The change in surface air temperature and rainfall patterns can affect the soil conditions and thereby affect the growth of crops in different regions. Food security can be at stake and worsen the levels of malnutrition .

Impact of Climate Change: Implications for developing countries

- Livelihoods: The frequent and erratic change in weather will adversely affect the livelihoods of the poor who even otherwise live on the margin. Failure of crops due to either floods or drought or rise in temperature can seriously limit their income.

Impact of Climate Change: Implications for developing countries

- Health: Scientific research indicates that Climate change which brings about frequent and unpredictable changes in weather can increase the frequency and spread of malaria and other vector borne diseases. Intense heat and cold spells can make the people , especially the poor, vulnerable to diseases and even death.

The Millennium Development Goals

- Goal 1 Eradicate extreme poverty and hunger
- Goal 2 Achieve universal primary education
- Goal 3 Promote gender equality and empower women
- Goal 4 Reduce child mortality

The Millennium Development Goals

- Goal 5 Improve maternal health.
- Goal 6 Combat HIV/AIDS, malaria and other diseases
- Goal 7 Ensure environmental sustainability
- Goal 8 Develop a global partnership for development

TABLE 1 ECONOMIC INDICATORS

COUNTRY	Population	Surface area	Population density	GNI		GNI per capita		PPP Gross National Income			Gross domestic product	
	Millions 2003	Thousand sq.km. 2003	People per sq.km. 2003	\$ billions 2003	Rank 2003	\$ 2003	Rank 2003	\$ billions 2003	Per capita \$ 2003	Rank 2003	% growth 2002-03	per capita % growth 2002-03
Bangladesh	138	144	1061	55	51	400	173	258	1870	163	5.3	3.4
India	1064	3287	358	570.8	12	540	159	3062	2880	146	8.6	7.1
Nepal	25	147	172	5.9	113	240	192	35	1420	179	3.1	0.8
Pakistan	148	796	193	77.6	44	520	161	303	2040	159	5.1	2.6
Sri Lanka	19	66	298	17.8	74	930	140	72	3740	136	5.9	4.7

Source : World Development Indicators 2005 Table : 1.1

Table 2 :A glimpse into vulnerabilities

COUNTRY	Urban informal sector employment % of urban employment		Youth unemployment		Children in the labor force % ages 10-14		Female headed households		Pension contributors			Private health expenditure
	Male 1995-02	Female 1995-02	Male % of male labor force 1995-03	Female % of female labor force 1995-03	1990	2003	Year	% of total	Year	% of labor force	% of working age population	% of total 2002
Bangladesh	..	..	11	10	32	27	1999-00	9	1993	3.5	2.6	74.8
India	54	41	..	..	17	11	1998-99	10	1992	10.6	7.9	78.7
Nepal	60	76	..	..	48	40	2001	16	..	..	..	72.8
Pakistan	64	61	11	29	20	14	1991	7	1993	3.5	2.1	65.1
Sri Lanka	..	..	20	31	3	1	..	..	1992	28.8	20.8	51.3

Source: World Development Indicators : Table 2.8

Table 3 Millennium Development Goals: Progress of Targets

COUNTRY	Eradicate extreme poverty and hunger		Achieve Universal primary education	Promote gender equality	Reduce child mortality	Improve maternal health	
	Share of poorest quintile in national consumption or income % 1990-2003	Prevalence of child malnutrition % of children < age 5 2000-03	Primary completion rate % 2000/01-2003/04	Ratio of female to male enrolments in primary and secondary school 2002/03	Under 5 mortality rate per 1000 2003	Maternal mortality ratio per 100000 live births 2000	Births attended by skilled health staff % of total 2000-03
Bangladesh	9.0	52	73	107	69	380	14
India	8.9	..	81	80	87	540	43
Nepal	7.6	48	78	83	82	740	11
Pakistan	8.8	35	..	71	98	500	23
Sri Lanka	8.3	..	113	103	15	92	87

Source: 2005 World Development Indicators: Table 1.2 & 1.3

Table 3 contd.. Millennium development Goals: Progress of Targets

COUNTRY	Combat HIV/Aids and other diseases		Ensure environmental sustainability			Develop a global partnership for development	
	HIV prevalence % of adults 2003	Incidence of TB per 100000 people 2003	CO ₂ Emissions Per capita metric tones 2000	Access to an improved water source % of population 2002	Access to improved sanitation facilities % of population 2002	Unemployment % ages 15-24 2002	Fixed line and mobile phone subscribers per 1000 people 2003
Bangladesh	..	246	0.2	75	48	11	16
India	0.9	168	1.1	86	30	..	71
Nepal	0.5	211	0.1	84	27	..	18
Pakistan	0.1	181	0.8	90	54	13	44
Sri Lanka	< 0.1	60	0.6	78	91	24	122

Source: 2005 World Development Indicators: Table 1.2 &1.3

Table 4 POVERTY

COUNTRY	National poverty line								International poverty line				
	Population below the poverty line				Population below the poverty line				Survey year	Population below \$1 a day	Poverty gap at \$1 a day	Population below \$2 a day	Poverty gap at \$2 a day
	Survey Year	Rural %	Urban %	National %	Survey Year	Rural %	Urban %	National %		%	%	%	%
Bangladesh	1995-96	55.2	29.4	51.0	2000	53.0	36.6	49.8	2000	36.0	8.1	82.8	36.3
India	1993-94	37.3	32.4	36.0	1999-00	30.2	24.7	28.6	1999-00	34.7	8.2	79.9	35.3
Nepal	1995-96	44.0	23.0	42.0	..	..	..	..	1995-96	37.7	9.7	82.5	37.5
Pakistan	1993	33.4	17.2	28.6	1998-99	35.9	24.2	32.6	1998-99	13.4	2.4	65.6	22.0
Sri Lanka	1990-91	22.0	15.0	20.0	1995-96	27.0	15.0	25.0	1999-00	7.6	1.5	50.7	15.2

Source: World Development Indicators 2005 : Table 2.5

Table 5 PUBLIC EXPENDITURE ON HEALTH AND EDUCATION

COUNTRY	Health expenditure		Public expenditure on education
	Public % of GDP 2002	Out of pocket % of private 2002	% of GDP 2002
Bangladesh	0.8	85.9	2.4
India	1.3	98.5	4.1
Nepal	1.4	92.2	3.4
Pakistan	1.1	98.3	1.8
Sri Lanka	1.8	95.1	..

Source: 2005 World Development Indicators: Table 2.9 & 2.14

Table 6 AGRICULTURAL LAND/OUTPUT/PRODUCTIVITY

COUNTRY	Arable land hectares per capita		Irrigated land % of cropland		Land under cereal production		Crop production index		Food production index		Cereal yield	
	1989-91	2000-02	1989-91	2000-02	thousands of hectares	1989-91	2000-02	1999-2001=100	1992-94	2002-04	1999-2001=100	1992-94	2002-04
Bangladesh	0.08	0.06	31.0	52.0	11,083	11,582	74.8	103.9	74.1	103.6	2583	3410
India	0.19	0.16	27.0	33.7	102,279	97,285	84.0	97.0	80.8	100.1	2,075	2,313
Nepal	0.13	0.13	41.0	35.4	3,013	3,318	75.2	107.3	77.2	106.0	1,786	2,258
Pakistan	0.19	0.15	80.4	81.1	11,794	12,204	79.9	100.4	76.8	105.9	1,893	2,332
Sri Lanka	0.05	0.05	27.1	33.1	810	864	89.4	98.4	91.2	99.6	2,961	3,305

Source: 2005 World Development Indicators Table 3.2 & 3.3

Challenges of Climate Change to MDGs

- Climate change can affect the ecosystem due to change in weather and rainfall conditions. This can adversely affect the availability of natural resources and degrade the environment, thus challenging the environmental sustainability.
- Non-availability or degradation of natural resources can adversely affect the welfare of female gender, in particular the female headed households, especially if their livelihoods depend on natural resources. This can perpetuate gender inequalities and achievement of universal child education.
- Also climate change can seriously erode the already meager assets that the poor have, thus perpetuating the poverty situation and undermining our efforts to reduce the percentage of population below poverty line or increase the level of nutritional intake.

Table 7 POPULATION PROJECTIONS

Country	2005	2010	2015	2020	2025
Bangladesh	1,41,822	1,54,960	1,68,158	1,81,180	1,93,752
Bhutan	2163	2414	2684	2950	3209
India	1,103,371	1,183,293	1,260,366	1,332,032	1,395,496
Maldives	329	371	416	461	506
Nepal	27,133	29,891	32,47	35,679	38,600
Pakistan	1,57,935	1,75,178	1,93,419	2,11,703	2,29,353
Sri Lanka	20,743	21,557	22,293	22,902	23,358

Source: Economic and Social Survey of Asia and the Pacific: 2006 Table A.3.

Table 8 GDP Growth Rates and Agricultural Sector Growth Rates

Country	GDP Growth Rates					Agricultural Sector Growth Rates				
	2001	2002	2003	2004	2005	2001	2002	2003	2004	2005
Bangladesh	5.3	4.4	5.3	6.3	5.4	3.1	0.0	3.1	4.1	0.3
Bhutan	8.6	7.1	6.8	8.7	8.8	5.0	3.1	1.7	3.2	3.2
India	5.8	3.8	8.5	7.5	8.1	6.2	-6.9	10.0	0.7	2.3
Maldives	3.4	6.5	8.4	8.8	..	5.0	15.9	1.9	2.9	..
Nepal	5.6	-0.6	3.1	3.7	2.6	5.5	2.2	2.5	3.9	2.8
Pakistan	1.8	3.1	5.1	6.4	8.4	-2.2	0.1	4.1	2.2	7.5
Sri Lanka	-1.5	4.0	6.0	5.4	5.5	-3.4	2.5	1.6	-0.7	-0.8

What needs to be done?

- The importance of government expenditure on social sectors is already emphasized and underlined.
- What actually needs to be done is not mere allocation of funds to social sector in the budgets but to actually establish a connection with the poor and vulnerable and guide them to develop their capabilities and open up new opportunities of employment and entrepreneurship so that they can diversify their sources of livelihood and get better equipped against the ill-effects of climate change. The rural sector needs to be developed by transforming the lives of the rural poor if we wish to reduce poverty levels.

Also.....

- The poor should have more access to credit facilities as well as to insurance to be prepared against future climate shocks.
- Natural disasters can result in income losses and also loss of school days for children due to damage to infrastructure. ‘Such natural disasters can cost up to an average of 5% of GDP for developing countries and can go up to 9% to 13% loss in GDP by 2100’. [Stern Review: 2006].
- It is imperative to develop adaptive capacity of the poor and vulnerable.

Adaptive Capacity

- **Agriculture:** research and development of high resilient crop seeds.
- Change in the traditional rotation of crops.
- Poor farmers can be given institutional and infrastructural support to develop adaptive capacity.
- **Water:** Irrigation facilities and effective management of water through proper storage and distribution and inclusion of rural women on local water management committees.
- Reforestation and grassland management to reduce run-off and increase deep percolation and develop resilience of the land to withstand climate shocks like floods and droughts.

Adaptive Capacity

- Health: increased awareness towards risks to diseases due to unhealthy living conditions. Awareness of low-cost food nutrients to reduce malnutrition.
- Building of health infrastructure and encourage health education and training to local women.
- Governance: Good governance like accountability, participation, transparency and minimization of corruption is also absolutely essential.
- Policy changes like linking corporate development to adoption of at least one of the MDGs in a risk-prone village by giving tax benefits and such other fiscal and monetary measures.