CLIMATE CHANGE AS THREATS TO NATIONAL AND REGIONAL STABILITY

Exploring Avenues of Regional Cooperation

Major General Muniruzzaman (Retd)
President
Bangladesh Institute of Peace and Security Studies (BIPSS)

Outline of Presentation

- Introduction
- Climate Change Landscape
- Consequences and Security Implications
- Threats to National and Regional Stability
- Common Grounds for Regional Cooperation?
- Towards a Regional Cooperation Mechanism
- Conclusion

Introduction

- Climate change has appeared as one of the greatest challenges to national and international security.

- Global warming is predicted to increase the frequency and intensity of various natural disasters i.e. tropical storms, flash floods, landslides etc. which can jeopardise the security of the individual and the state to a great extent.

Introduction (contd.)

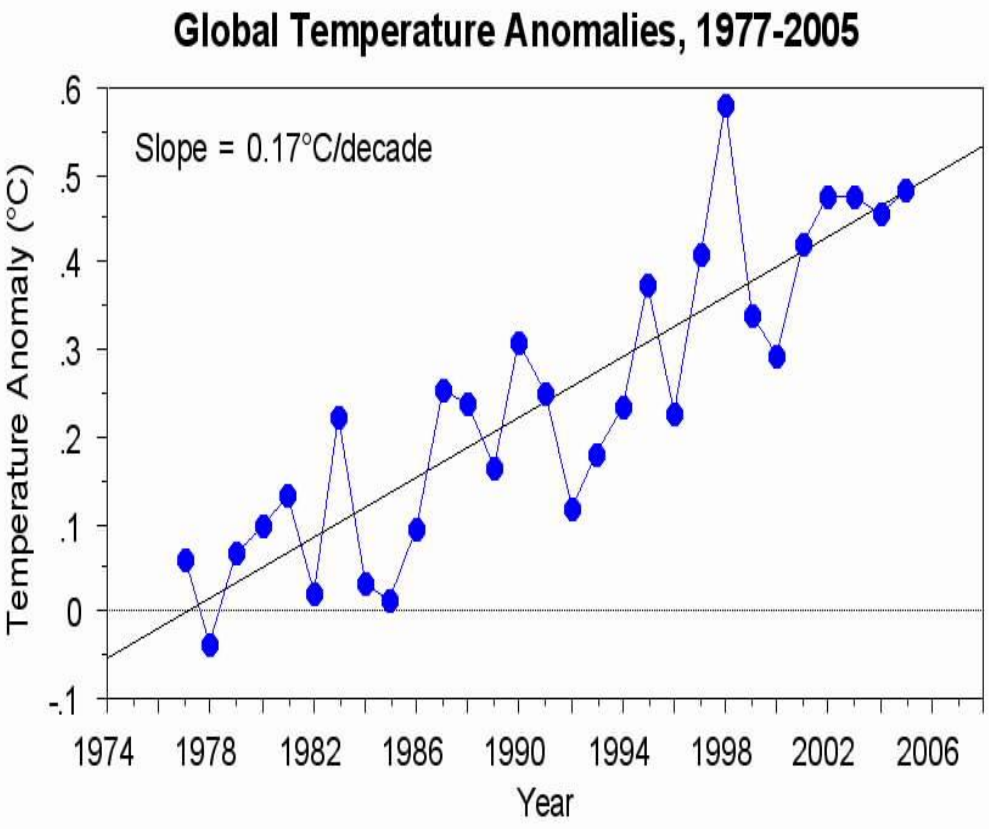
- In South Asia, being the most crisis-ridden in the world, climate change reinforces present trends of instability and conflict while at the same time draw new lines of conflict within and between states.
- Disastrous impact of climate change opens new avenues for cooperation and dialogue in the region inviting a joint effort to abate the vulnerability of the region to climate change.

Current Status of Climate Change

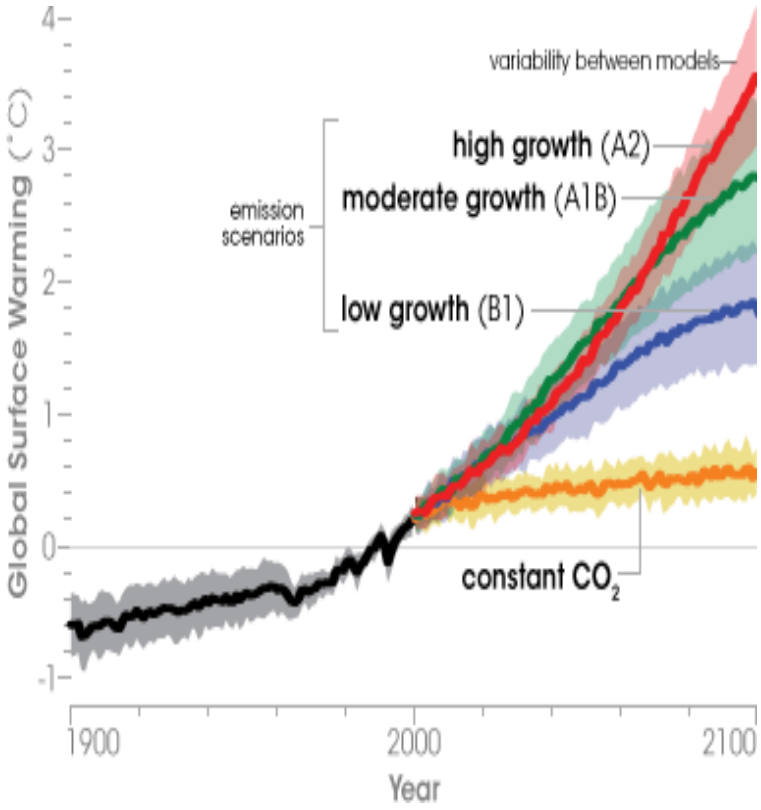
- Long-term changes in climate observed:
  - arctic temperatures and ice
  - precipitation amounts
  - ocean salinity
  - wind patterns and
  - aspects of extreme weather including droughts, heat waves and
  - the intensity of tropical cyclones

Current Status, (contd.)

- The 2007 IPCC report predicts temperature rise of 1.1 - 6.4 °C (2 - 11.5 °F) by 2100.

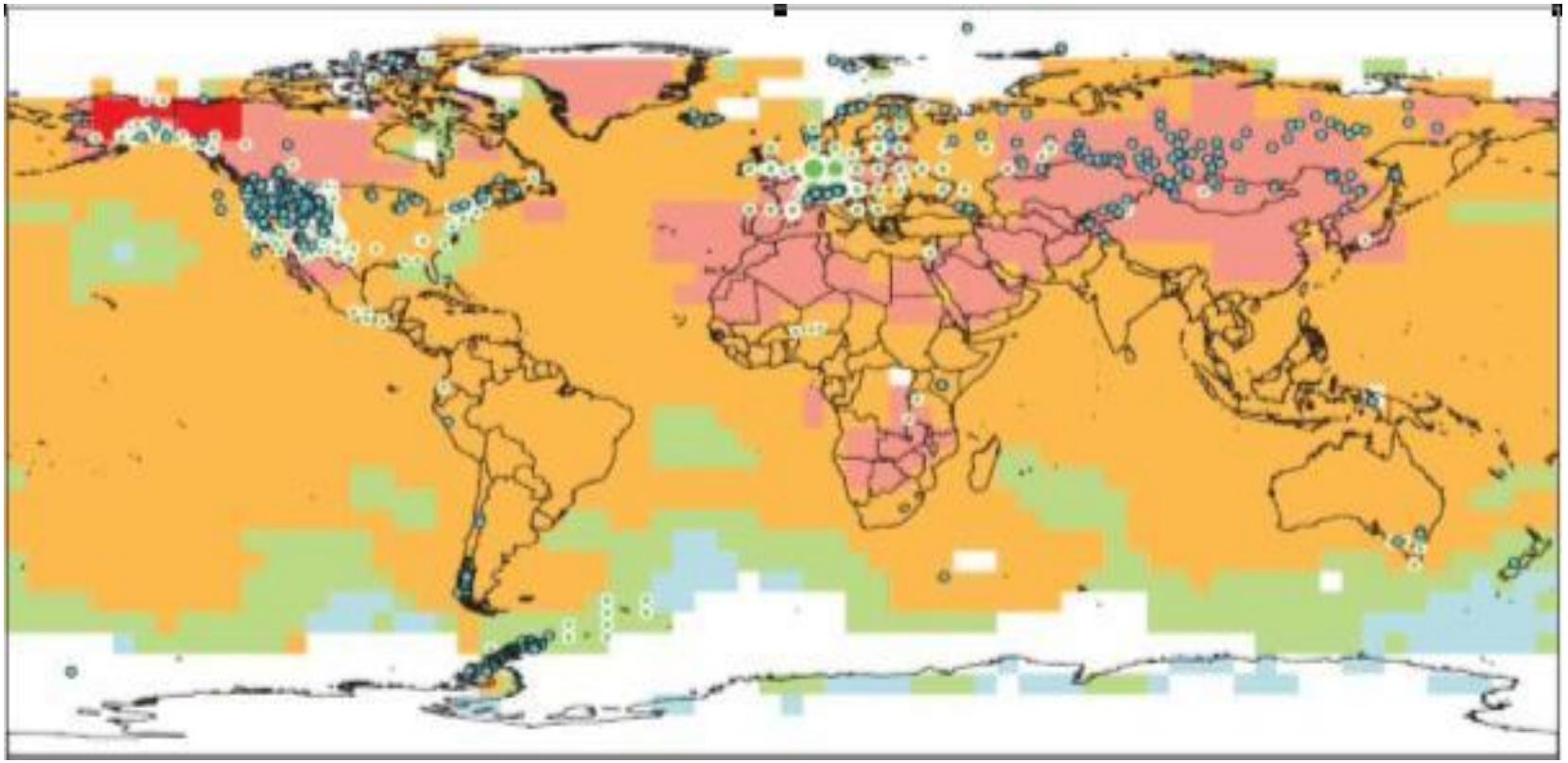


IPCC Warming Projections



Source:
Environmental Protection Agency

Changes in Temperature

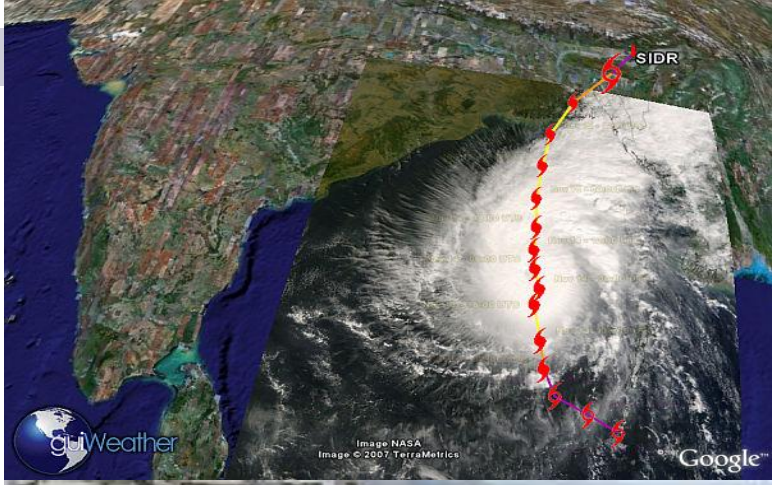


Current Status(contd.)

- **The number of natural disasters in the world may double during the next 10 to 15 years. (Source: WWF)**

- **3,852 disasters killed more than 780,000 people over the past ten years, affected more than two billion others and cost a minimum of 960 billion US$.**

  (Source: figures released by CRED in Geneva)



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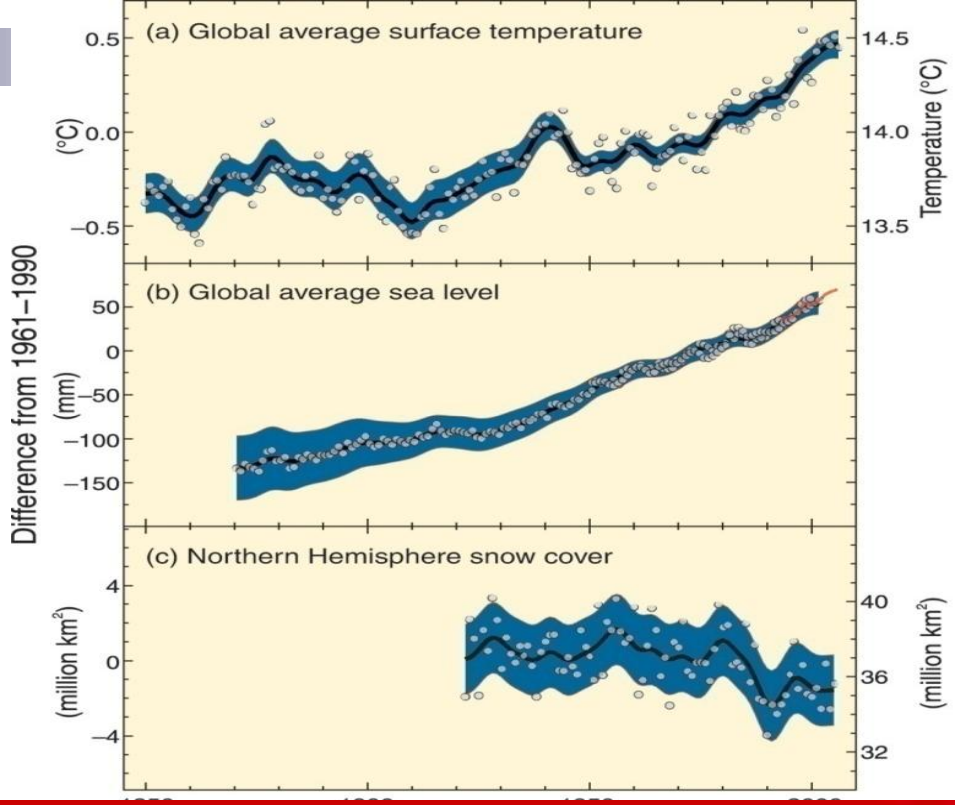
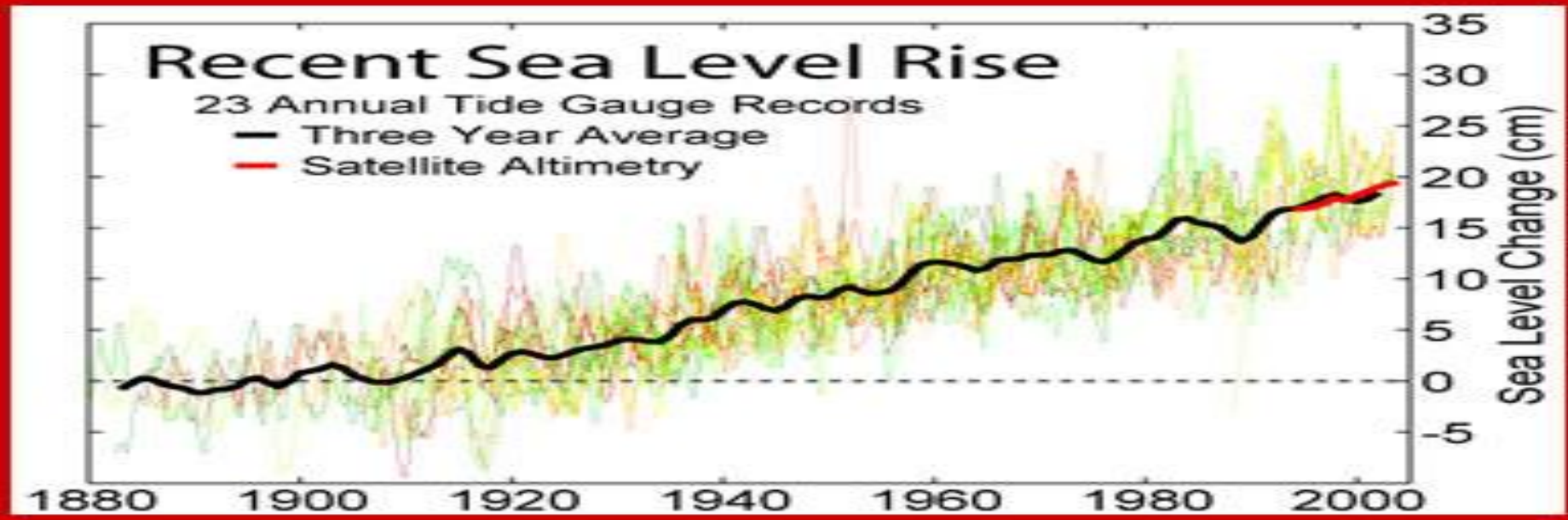
Significant Sea level rise by 2100 is predicted by IPCC.





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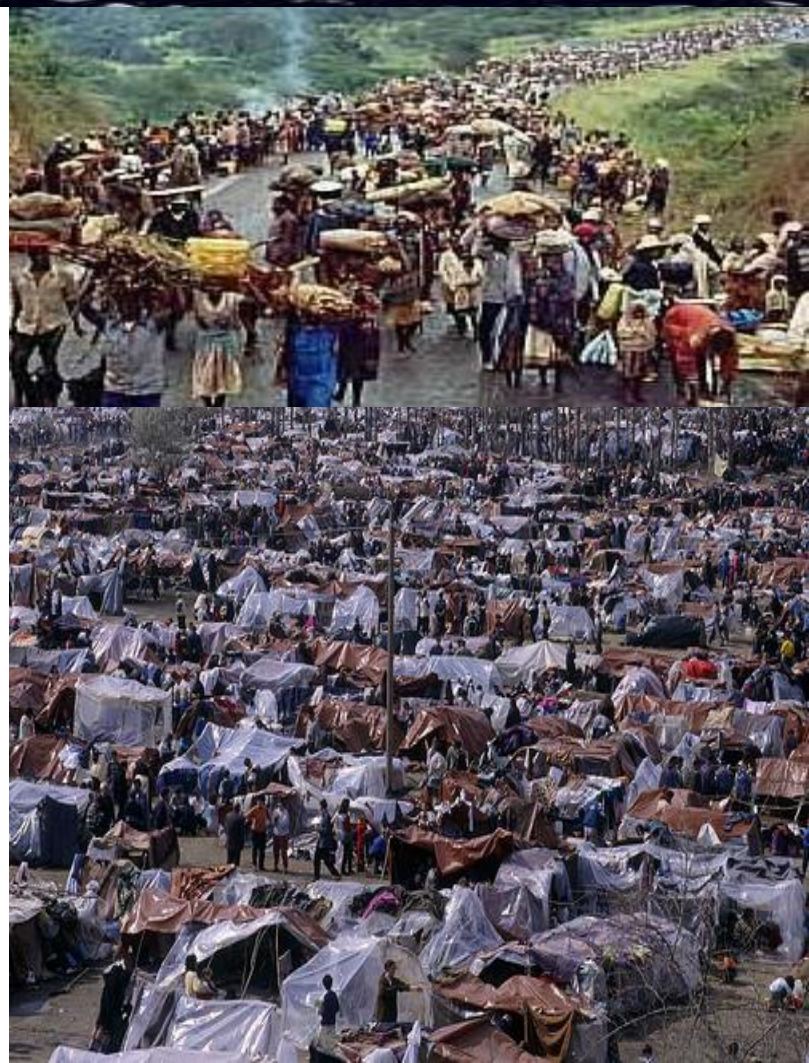


- The 2001 World Disasters Report of the Red Cross and Red Crescent Societies estimated of 25 million current “environmental refugees”.

- UN University’s Institute for Environment and Human Security estimates the rise of environmental refugees up to 50 million.

Current Status (contd.)

- South Asia with its population of about 1.3 billion is one of the world's regions highly exposed to a variety of natural as well as human induced hazards.

- Countries experienced a number of major disasters in the last one and a half decades, which took lives of about half a million people and caused huge economic losses and massive destruction.

- People in South Asia face largely common natural disasters like cyclone, storm, flood; they need to find solutions through a common platform.

Threat Landscape

Mainly two dimension:

- Human Security
- Hard Security

Dimensions of Human Security

- Water Security
- Food Security
- Livelihood Security
- Health Security
- Disaster security.
- Energy security

Water Security

- Climate change exacerbates water quality and availability in regions with water scarcity: Africa, South Asia, Southwest Asia, the Middle East and the Mediterranean.
- The availability of freshwater will be reduced by increased salinity intrusion into fresh water sources during the low flow conditions.
- Currently 1.1 thousand million people are without access to safe drinking water.

Water Security (contd.)

- **More than 3.5 million people die each year from water-related disease; 84 percent are children. Nearly all deaths, 98 percent, in the developing world.** (Source: IPCC 4th Ass on climate change in Asia)
- **Freshwater availability in Central, South, East and South-East Asia is likely to decrease that could adversely affect more than a billion people in Asia by the 2050.** (Source: IPCC 4th Ass on climate change in Asia)

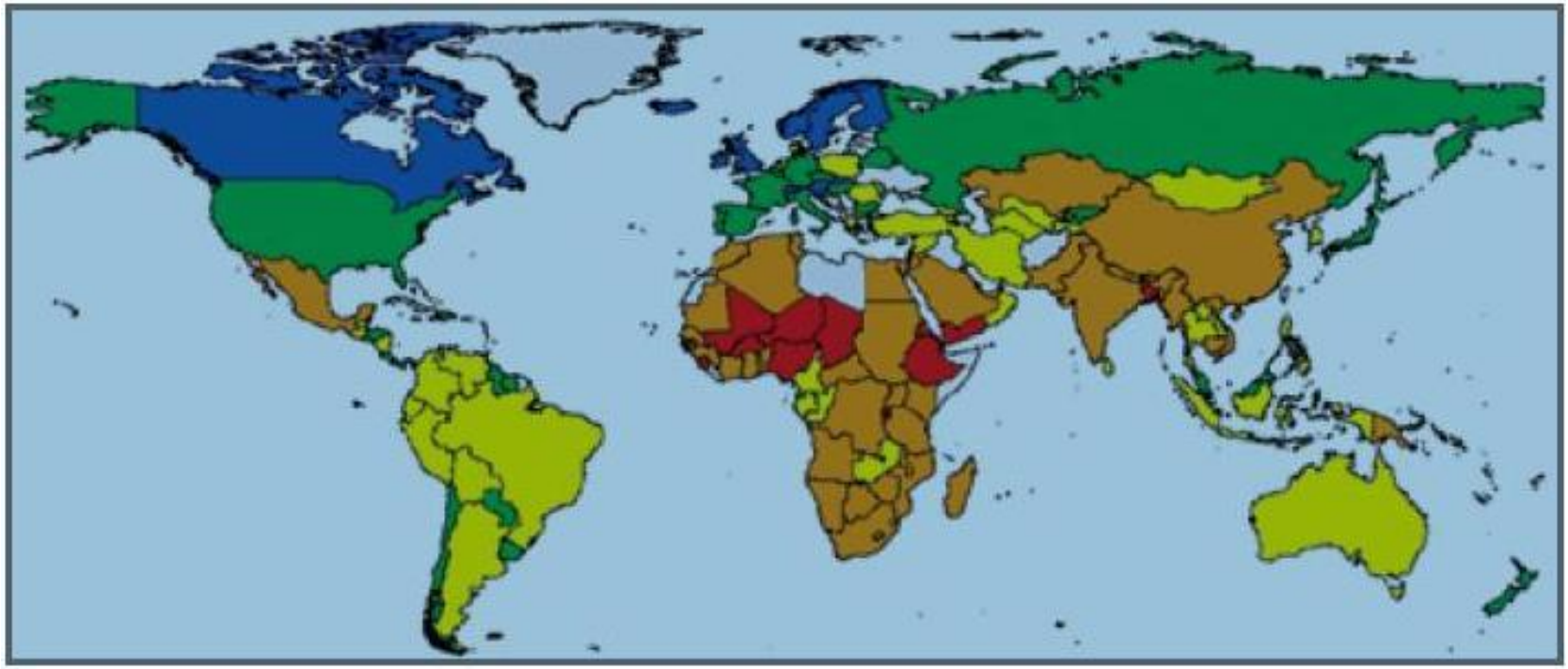

FLOOD VICTIMS IN BANGLADESH

Water Security (contd.)

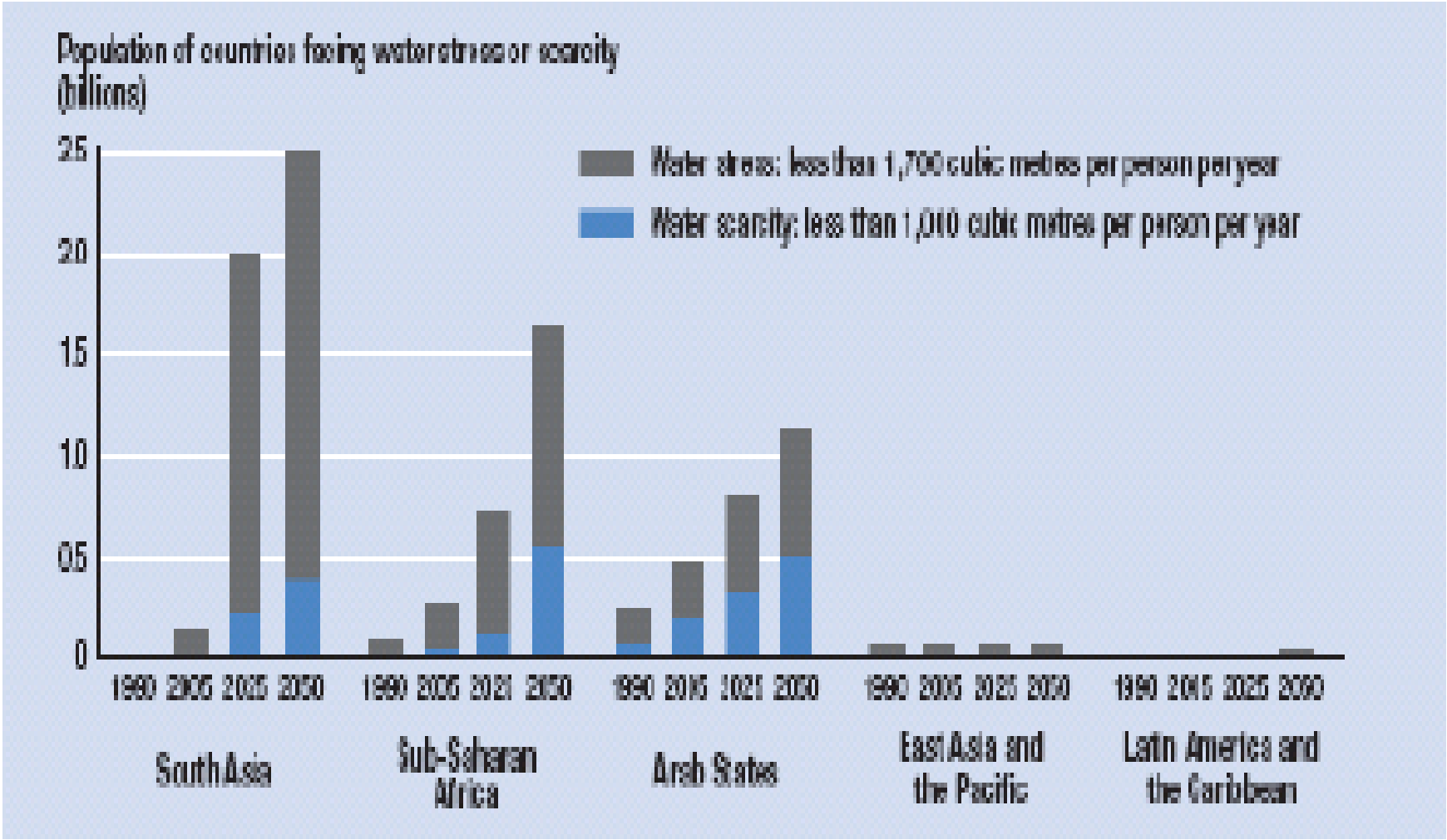
- **In South Asia, climate change increases the variability of water supply, leading to floods during some parts of the year and droughts in others.**
- **Increasing water shortages relative to population growth are putting the Indus Basin irrigation and drainage system in danger of collapse.**
- **120 million to 1.2 billion will experience increased water stress by the 2020s in South and South East Asia.**

(Source: IPCC 4th Ass on climate change in Asia)

Areas Vulnerable to Climate Related Water Challenges



Projected Stress in Water Availability (2025-2050)



Source: HDR, 2006

Water Availability in South Asia

	Sanitation (%) (1990-97)		Safe drinking water(%) (1995)		Health services(%) (1985-95)		Illiteracy* (%)	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Bangladesh	83	38	49	n.a	n.a	n.a	38	67
India	70	14	n.a	82	100	80	27	55
Nepal	28	14	61	59	n.a	n.a	36	64
Pakistan	93	39	85	56	99	35	43	n.a
Sri Lanka	68	62	88	65	n.a	n.a	7	15

IFAD, 2001
n.a data not available
Illiteracy data: Bangladesh :1991, India: 1991, Nepal:1995, Pakistan: 1994, Sri Lanka: 1981

Food Security

- Reduced agricultural productivity is potentially the most worrisome consequence of climate change.
- If global warming rises to 3 ^{0} C it is likely that the number of people suffering from hunger will increase by 250 million to 550 million. (Stern 2006:72)
- The combination of various climate change impacts will overstretch adaptive capacities in agricultural production. (IPCC, 2007)

Food Security (contd.)

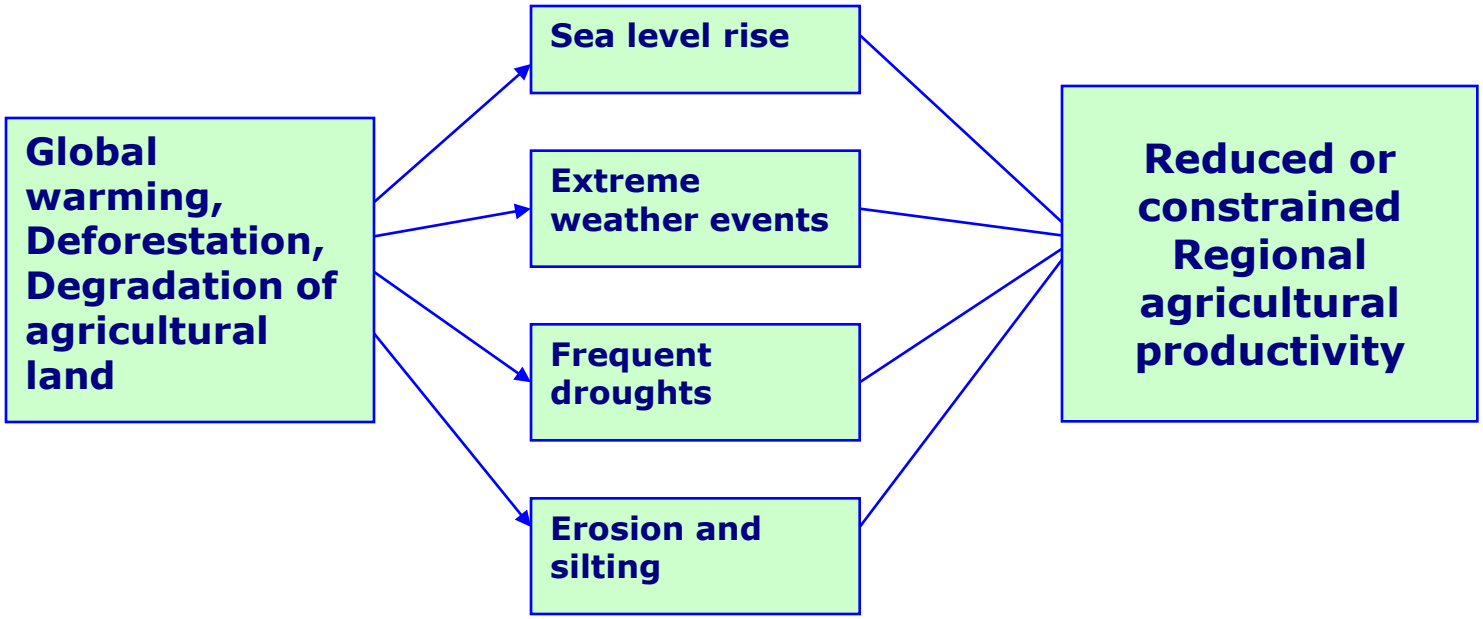
- Desertification and soil erosion will lead to a decrease in available farmland and a reduction in potential yields (IPCC, 2007)
- According to German Advisory Council on Global Change agricultural production from rain-fed agriculture could fall by about 50% in some regions by 2020 (WBGU 2007)
- In South Asia food shortage is acute because the population has grown quicker than has the rate of food production.

Rising Food Price

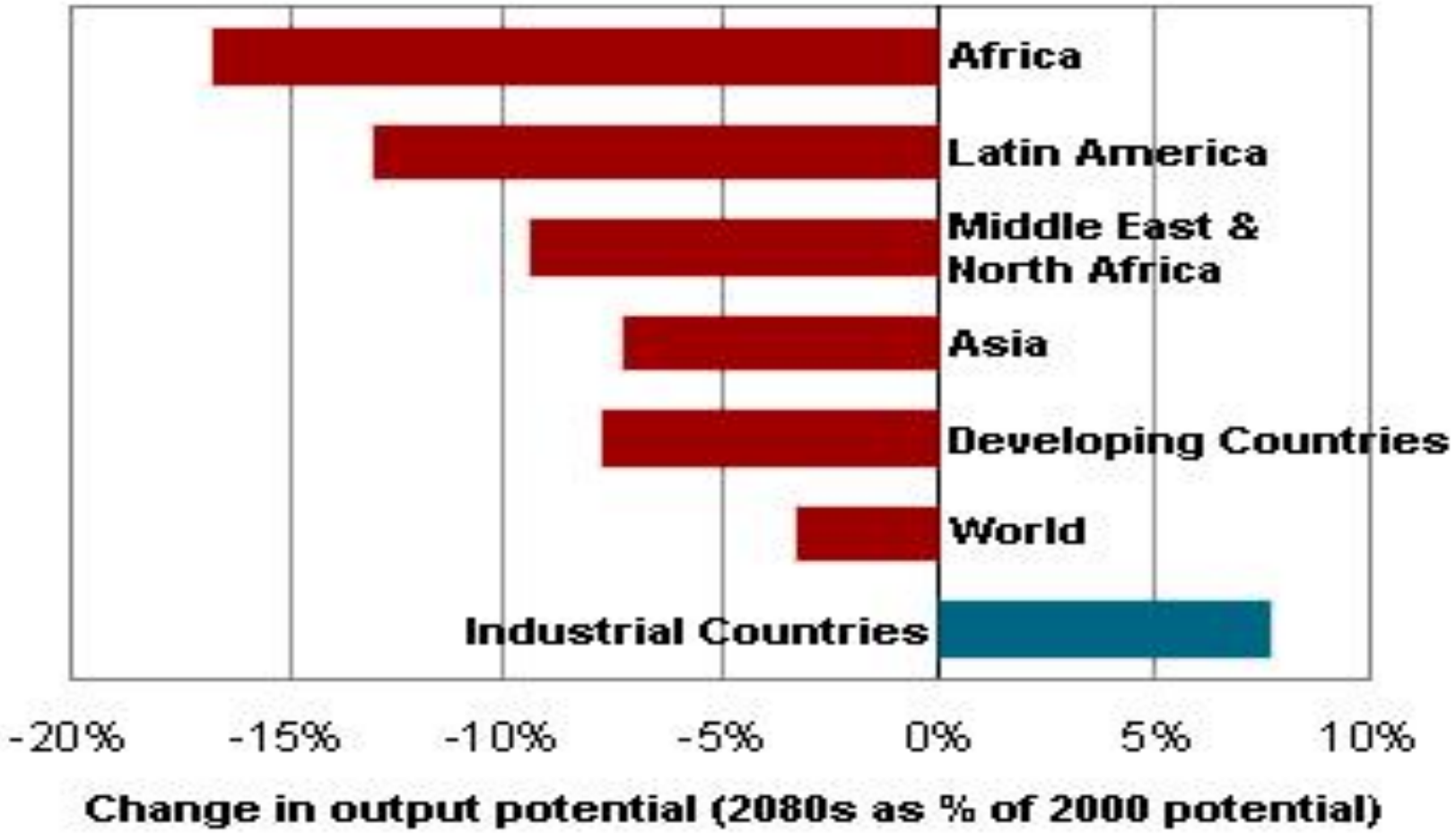
It has been estimated that rising food prices could potentially push 100 million people back into poverty
(Source: SA Forum on Food Insecurity, 2008)

Source : FAO

Possible Effects of Environmental Change on Agricultural Productivity



Impact on Agriculture Output Potential



Source: Earth Trends, 2008

Climate Change Impacts on South Asian Agriculture

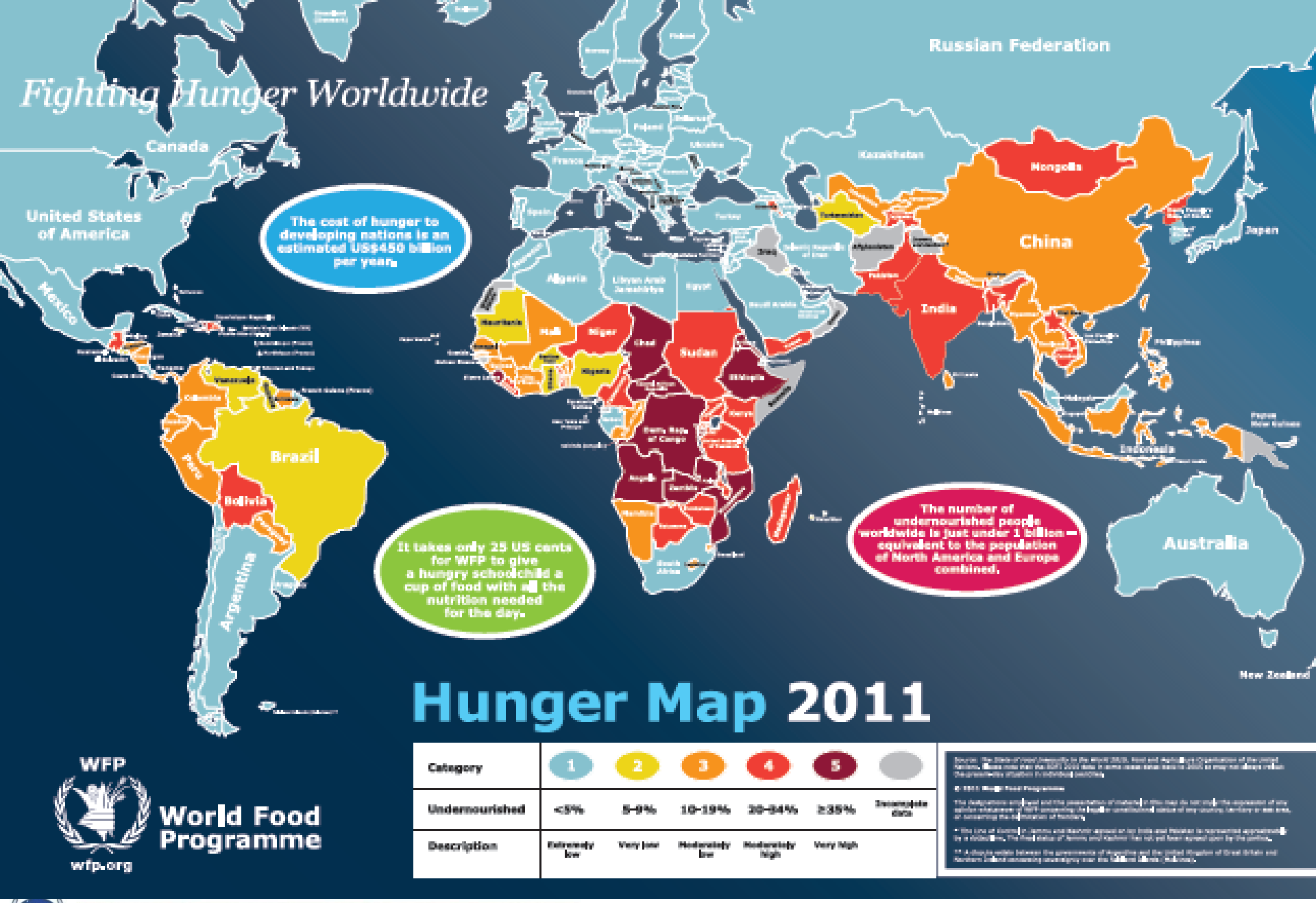
(percentage of 2100 agricultural GDP)

Country	CCC	CCSR	PCM
Bangladesh	-0.6 to -59	-0.6 to -23	-0.6 to -3
India	-0.6 to -52	-0.9 to -29	+0.3 to -3
Nepal	0 to -15	0 to -15	0 to +9
Pakistan	-1.1 to -82	-1.1 to -3	+2.6 to +9
Sri Lanka	0 to -53	0 to -18	0 to +12

Source: Mendelsohn, 2005)

Food Insecurity in South Asia

Indicators	Bangladesh	India	Maldives	Nepal	Pakistan	Sri Lanka
	2002-04	2002-04	2002-04	2002-04	2002-04	2002-04
Population (million)	146.7	1065.4	0.32	25.2	153.6	19.1
Food Supply (kcal/person/day)	2200	2470	2600	2430	2320	2390
Number of undernourished (million)	44	209.5	31.9	4.4	37.5	4.2
Proportion of under-nourishment (%)	30	20	10	17	24	22
Dietary energy consumption (kcal/person/day)	2200	2440	2560	2450	2340	2390
	2000	2000		1996	1999	1996
National (Poverty headcount, (% of population))	49.8	28.6	-	42	32.6	25
Rural (Poverty headcount, (% of population))	53	30.2	-	44	35.9	27
Urban (Poverty headcount, (%) of population))	36.6	24.7	-	23	24.2	15
	2000	1999-00		1995-96	1998-99	1995
Gini of income (%)	32	33	-	37	33	34
	1981-82	1990	1995	1995	1988	1986
Gini of dietary energy consumption (%)	18	18	14*	15*	18	16



BIPSS
Towards a Secure World
Bangladesh Institute of Peace and Security Studies

Source : WFO 27

Health Security

- **A changing climate affects the essential ingredients of maintaining good health: clean air and water, sufficient food and adequate shelter.**

- **Every year the health of 235 million people is likely to be seriously affected by gradual environmental degradation due to climate change.**

Source : http://www.eird.org/publications/humanimpactreport.pdf

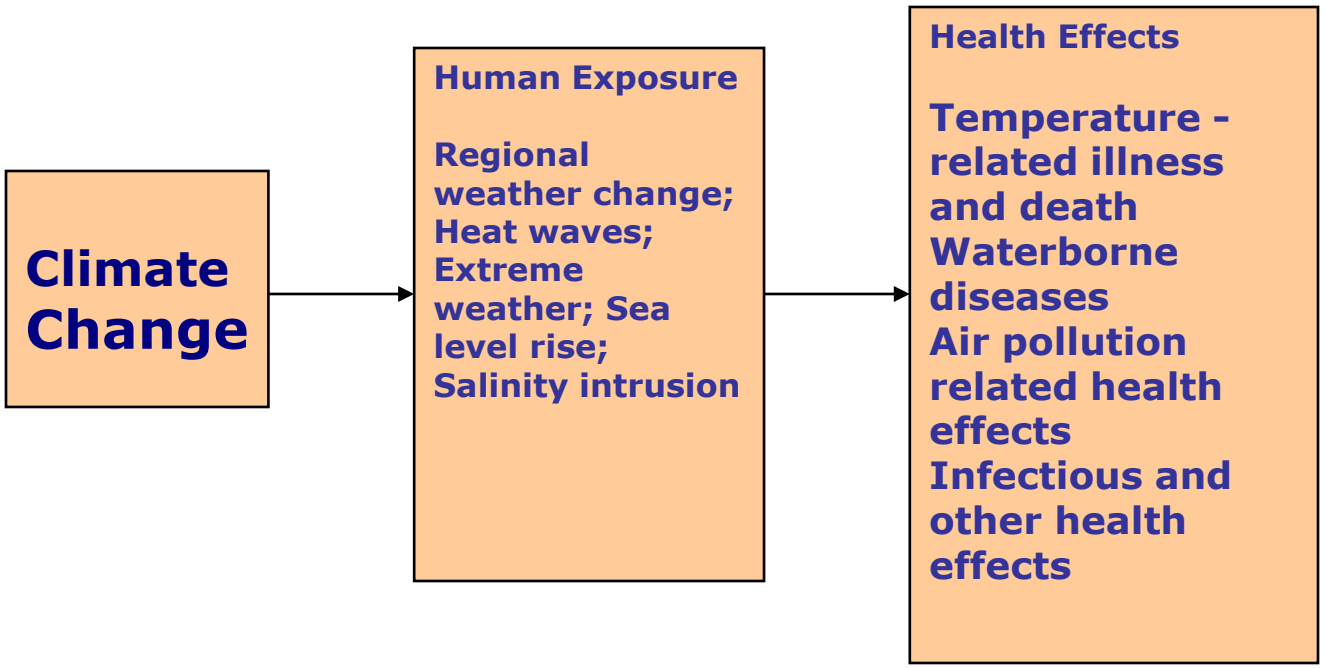
Health Security (contd.)

- **Climate change is projected to cause over 150,000 deaths annually and almost 45 million people are estimated to be malnourished because of climate change.**
- **Climate change-related diarrhoea incidences are projected to amount to over 180 million cases annually, resulting in almost 95,000 fatalities.**

Source: http://www.eird.org/publications/humanimpactreport.pdf

- **In South Asia merely 37 per cent people have access to improved hygiene. (New Age, 31 March, 2011)**

Impact of Climate Change on Human Health



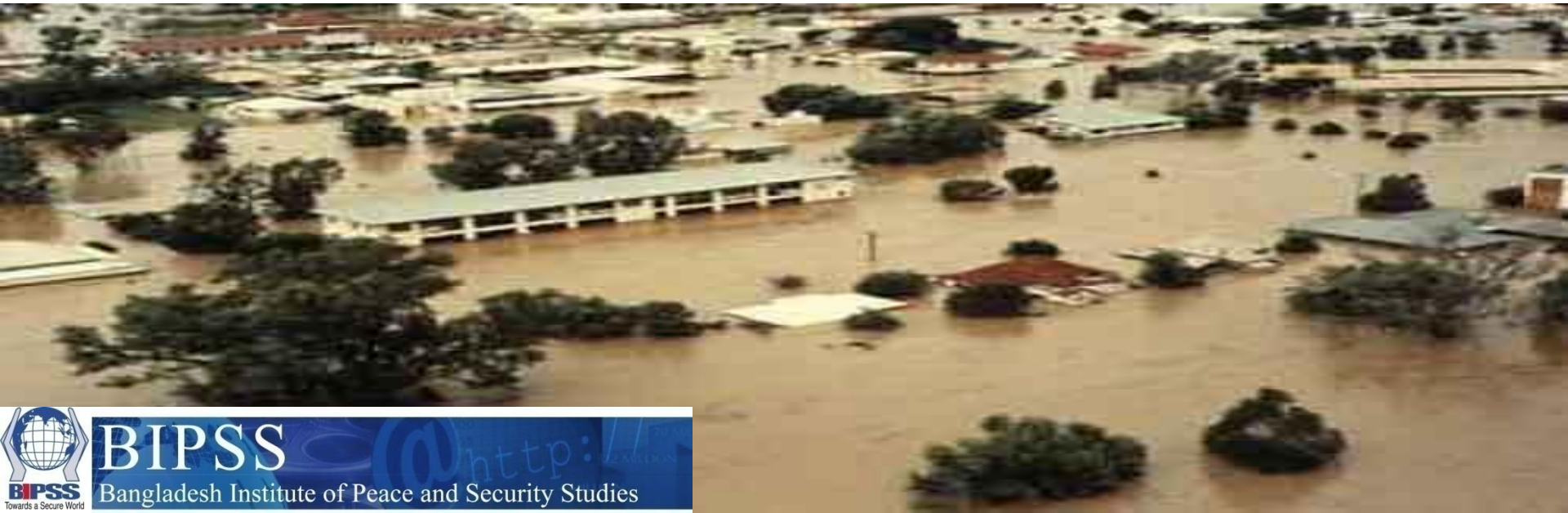
Disaster Security

- Direct economic losses and human casualties of global disasters have increased in recent decades with particularly large increases since the 1980s.
- Climate change and variability are factors which influence trends- frequency and intensity of disasters.

Contd.

- In recent years, unprecedented floods: Africa's worst floods in three decades, unprecedented flooding in Mexico, massive floods in South Asia and heat waves and forest fires in Europe, Australia, and California.

- According to Oxfam estimate developing countries will require at least US$50bn annually to adapt to unavoidable climate change.



The Human Casualties from natural disasters in South Asia

	Afghanistan	Bangladesh	Bhutan	India	Maldives	Nepal	Pakistan	Sri Lanka	Total
Drought	37	0	0	20	0	0	143	0	200
Earthquake	8673	33	11	49096	102	0	73991	35399	237948
Epidemic	3845	3818	0	3436	0	3551	246	473	15445
Extreme temperature	1889	2186	0	9395	0	126	1211	0	14807
Flood	3300	5363	222	27630	0	3752	8558	509	51344
Mass movement wet	886	0	0	1901	0	1011	484	65	4420
Storm	341	148227	29	19364	0	26	1348	14	169423
Total	18971	159627	262	110842	102	8466	85981	36460	493787

Source: "EM-DAT: The OFDA/CRED International Disaster Database

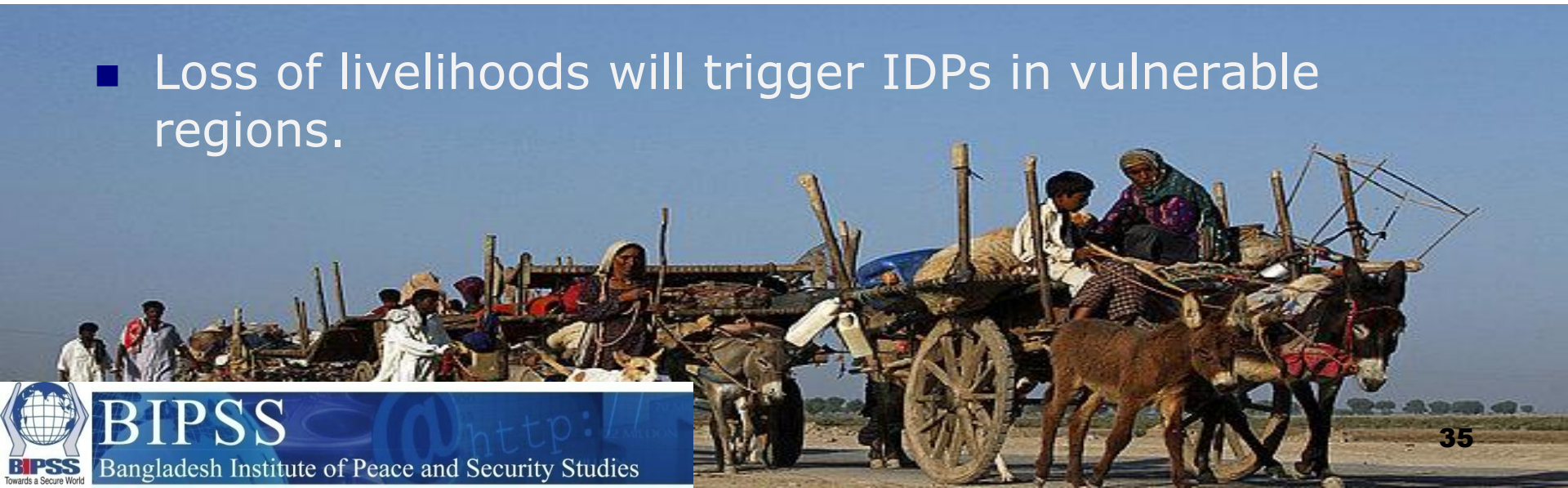
Energy Security

- Climate induced consequences makes energy security more vulnerable which has wide ranging implications.
- The impacts of climate change may damage key infrastructures, such as energy supply, and consequently destabilise public order.
- The decline in hydroelectric power generation may additionally reinforce competition/conflicts over fossil energy sources.

Migration/IDPs.

- Climate change could potentially trigger large-scale displacement and migration from one region to other in search of new avenues for employment and/or settlement.
- It is estimated that by 2050, 150 million people could be displaced by climate change related phenomenon like desertification, increasing water scarcity, floods and storm etc. (IPCC Ass. Report).

- Loss of livelihoods will trigger IDPs in vulnerable regions.



Hard Security

- Socio-political and economic unrest.
- Radicalisation and terrorism
- Resource conflict
- Inter and/or Intra-state conflict potentials.
- State collapse.
- Regional conflicts.

Radicalisation and Terrorism

- Radicalisation and terrorism may increase in many developing societies particularly in South Asia due to the climate induced social and economic deprivation.
- When a government can no longer deliver services to its people, conditions are ripe for the extremists and terrorists to fill the vacuum.
- The Rohingyas of Myanmar is a very relevant example of how marginalized people get involved in radicalisation and subsequently to terrorism.

Conflict over Resources

- Resource scarcity has the potential to be a contributing factor to conflict and instability.
- The 1994 genocide in Rwanda was furthered by violence over agricultural resources.
- The 1974 Nigerian coup that resulted largely from an insufficient response to famine.
- Situation in Darfur, Sudan, which had land resources at its root and which is increasingly spilling over into neighboring Chad.
- In the late 1990s conflict took place over timber resources in Liberia.

(Source: CNA Report, 2009)

Challenges of Environmental Scarcity

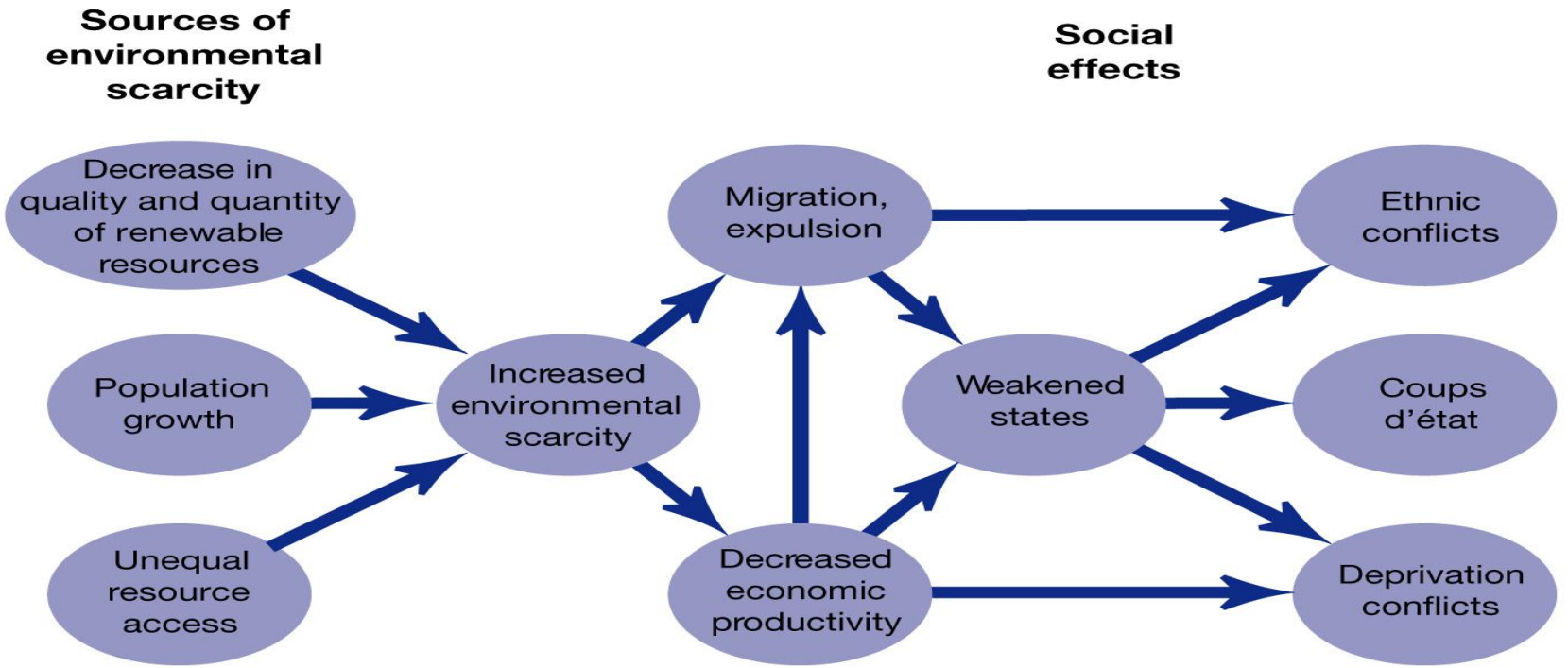


FIGURE 10.3 Some Sources and Consequences of Environmental Scarcity

Inter-state Conflict

- Rising tension
- Localised war
- Inter-state conflict/war

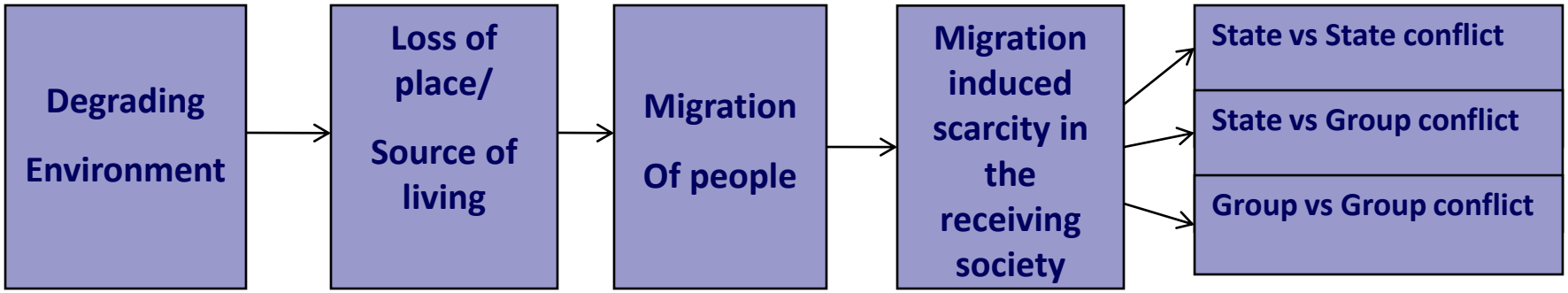
"For centuries, wars have been fought for territorial expansion, ideological or religious dominance, and national pride. In the future, as climate change progresses and its effects become more pronounced, conflicts between states over natural resources could increasingly take centre-stage."

Byers & Dragojlovic, Human Security Bulletin, October 2004

Intra-state Conflict

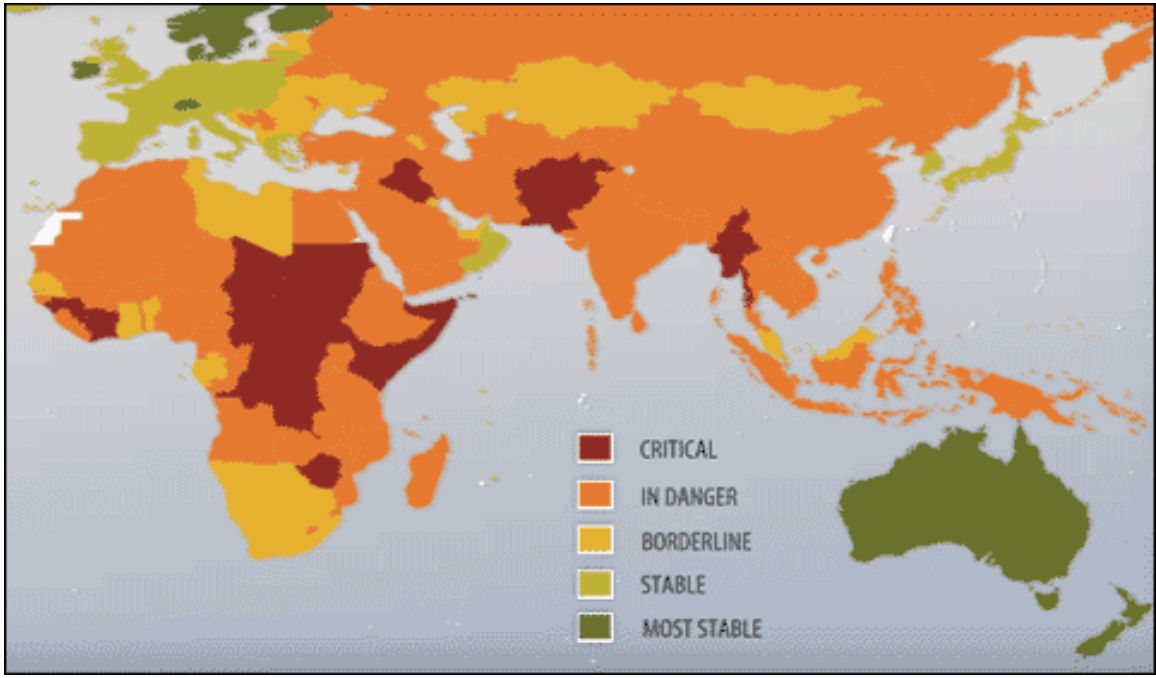
- Ethnic conflict
- Civil strife
- Terrorism
- Social Fragmentation

The Environmental Trap: Environment and Conflict



State Collapse

- Vulnerable state
- Weak state
- Fragile state
- Failed state
- Non-state

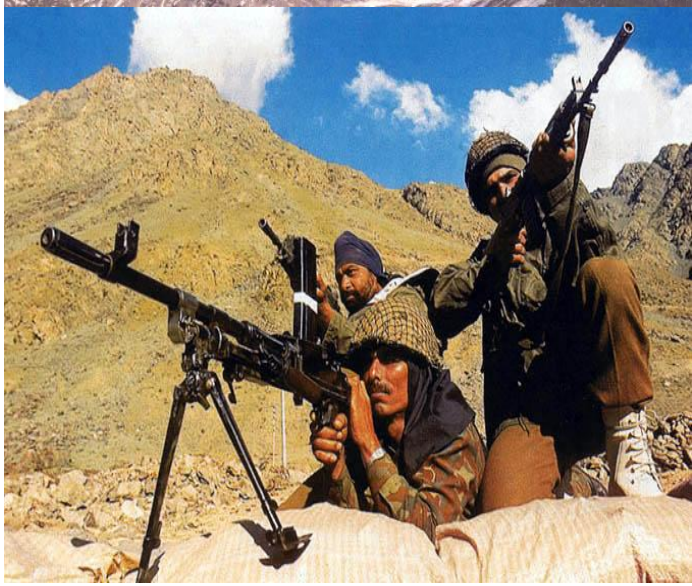


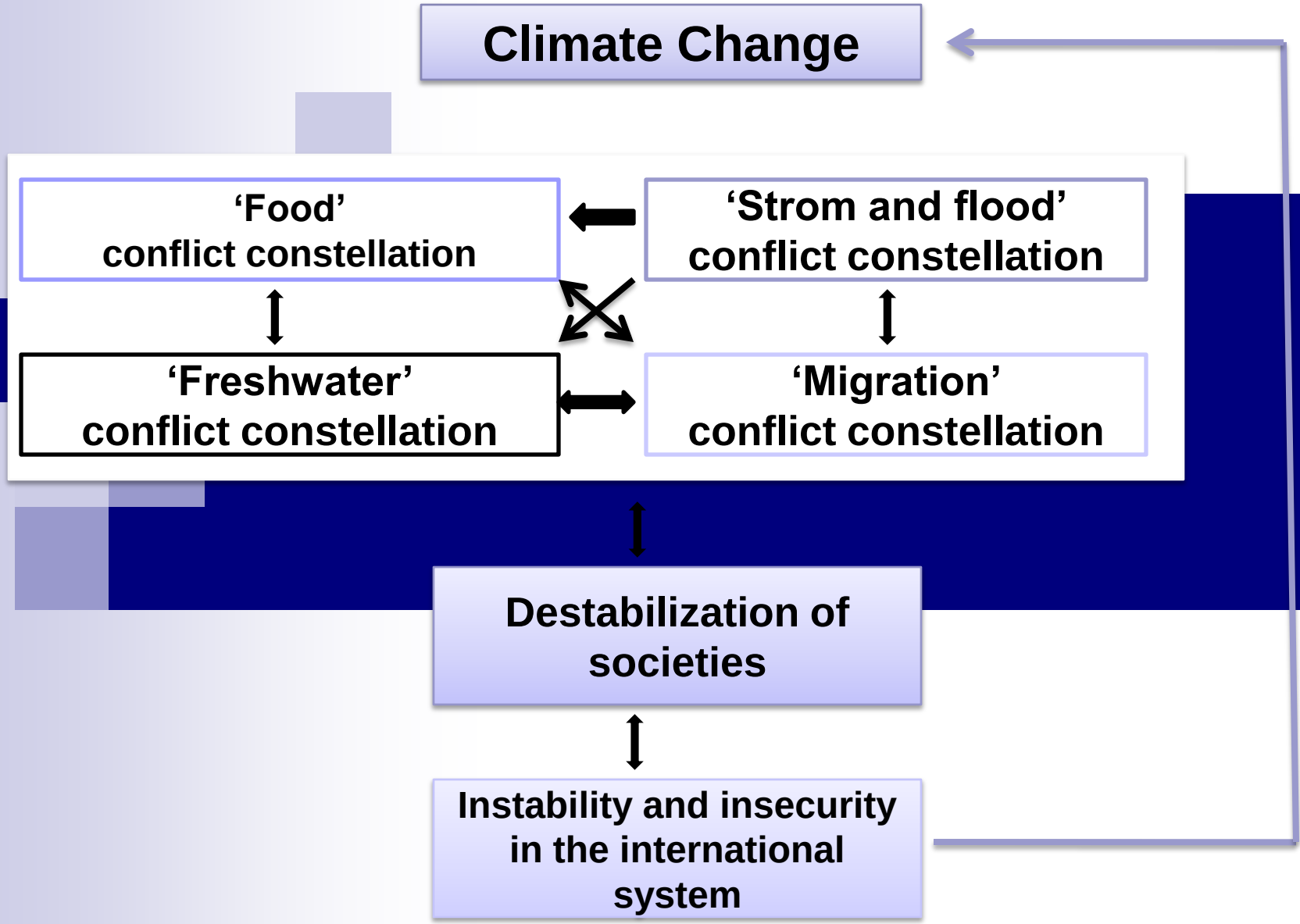
"When climate change significantly or environmental conditions deteriorate to the point that necessary resources are not available, societies can become stressed sometimes to the point of collapse"

CNA Report on the National Security and the Threat of Climate Change

Regional Destabilisation

- Climate change acts as a threat multiplier for instability in some of the most volatile regions including South Asia.
- Projected climate change will seriously exacerbate already marginal living standards in many Asian, African, and Middle Eastern nations, causing widespread political instability and the likelihood of failed state.





Climate Change as drivers of international destabilization

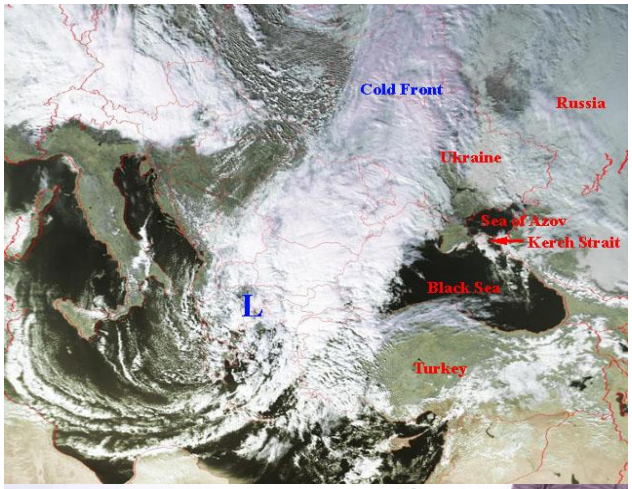
National Impacts: Bangladesh Case

Environmental Degradation in Bangladesh

- Natural Disasters (Flood, Draught, Cyclone, Earthquake, Tornado)
- Soil Erosion
- Sea Level Rise
- Scarcity of Foods
- Scarcity of Natural Resources
- Scarcity of Water

Global Warming Impacts on Bangladesh

- If nothing is done to curb emissions, sea levels could climb more than three feet
- 17- 20% of Bangladesh could be under water if sea water rises 1 meter (IPCC Report)
- The mangrove forests of Sundarban islands, a world heritage site, the Bengal tiger and hundreds of bird species may disappear



Source:http://www.askasia.org/

Contd.

- Tens of millions of Internally Displaced Persons(IDPs)
- Bangladesh's food supply is already threatened by flooding due to melting glaciers in some areas and droughts due to heat in others
- Environmental issues can also fuel violence and political unrest

Source:http://www.askasia.org/

Contd.

- Millions of people in northern Bangladesh are threatened by river bank erosion and severe droughts

- The Bhola Islanders have been described as some of the world's first climate refugees, displaced because of climate change induced environmental disasters

Contd.

- The rainfall could increase to 10% at the same time, changing drastically usual rainfall patterns

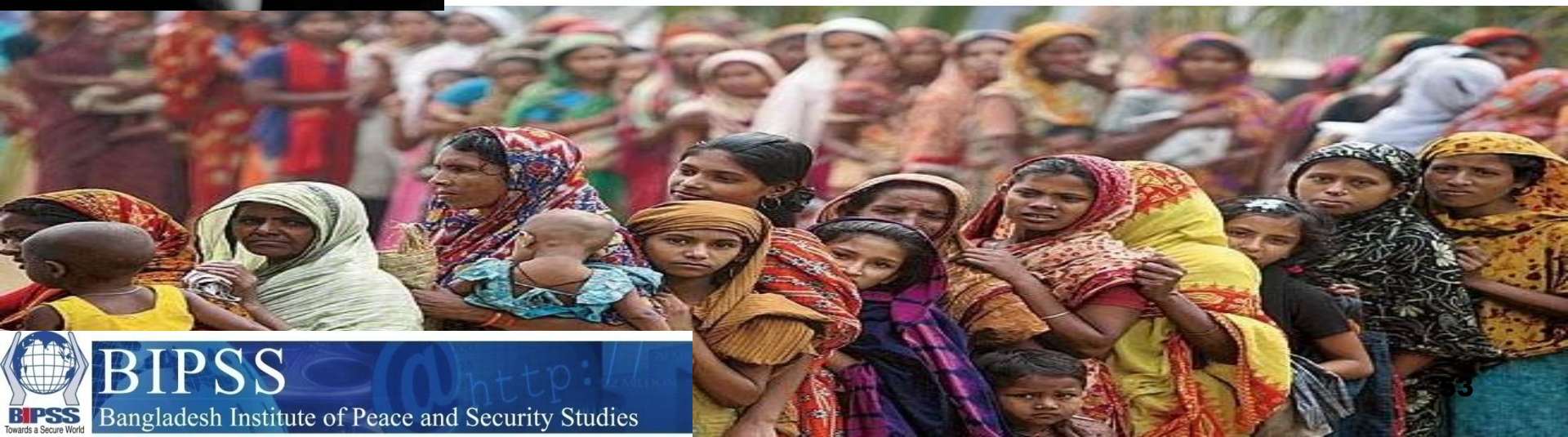
- The seawater rise would cause more havoc as it is estimated that by 2100 the level would increase by 88 cm from the current level

Food Scarcity in Bangladesh

- According to the World Bank, approximately 33 million of the 150 million people in Bangladesh cannot afford an average daily intake of more than 1800 kilocalories (the minimum standard for nutrition as set by the World Food Program)

Contd.

- In 2008, 65 million people (approximately 45 percent of the population) were food insecure and consumed less than 2, 133 kcal per day in Bangladesh (WFP 2009)
- By 2008, the poor were spending 80 percent of their income on food in comparison to 70 percent in the previous year (WFP 2009).



Water Shortage in Bangladesh

- Lack of access to adequate safe and drinking water
- Contamination & disease due to lack of safe water
- Lack of water for irrigation & cultivation
- Irregular discharge of water
- Between 35 and 77 million of the 125 million Bangladeshis were at risk of drinking contaminated water.(WHO, 2000)

Flood: Is Bangladesh Sinking?

Impacts of Major Floods in Bangladesh

Event	Impact
1954 floods	Affected 55% of country
1974 flood	Moderately severe, over 2,000 deaths, affected 58% of country, followed by famine with over 30,000 deaths
1984 flood	Inundated 52,520 sq-km, cost estimated at US$378 million
1987 floods	inundated over 50,000 sq-km, estimated damage US$ 1.0 billion, 2055 deaths
1988 floods	Inundated 61% of country, estimated damage US$ 1.2 billion, more than 45 million homeless, between 2,000-6,500 deaths
1998 floods	1,100 deaths, inundated nearly 100,000 sq-km, rendered 30 million people homeless, damaged 500,000 homes, heavy loss to infrastructure, estimated damage US$ 2.8 billion
2004 floods	Inundation 38%, damage US$ 6.6 billion, deaths 700, affected people nearly 3.8 million

Health Hazards

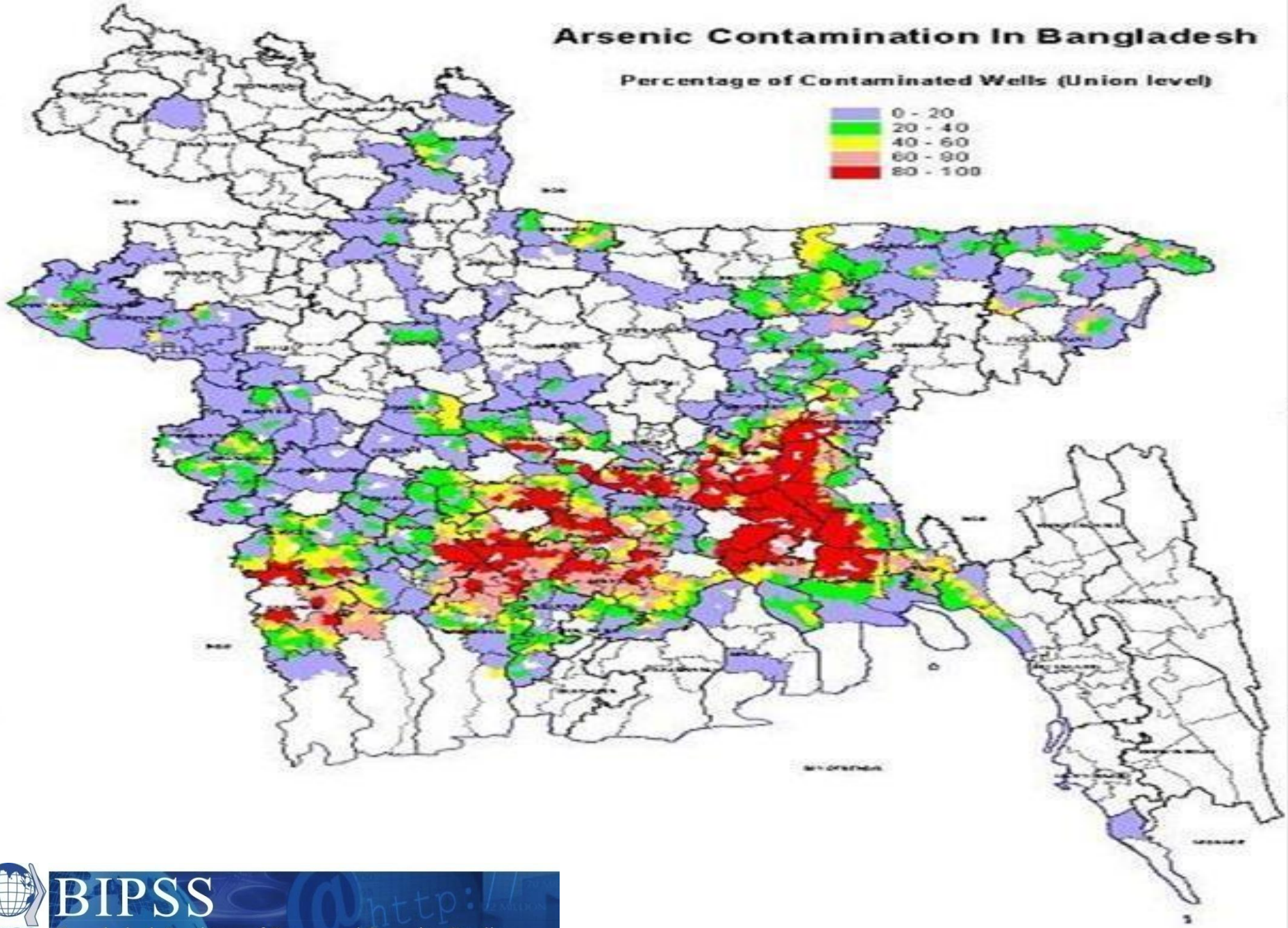
Spread of Climate-sensitive Diseases in Bangladesh

Diseases	Total cases per period	Period	Average annual cases
Diarrhoea	48302636	1988-2005	2842273
Skin diseases	23697833	1988-1996	2623092
Malaria	1018671	1974-2004	33956
Mental disorders	201881	1988-1996	22431
Dengue	19830	1999-2005	3305

Source:http://www.searo.who.int/LinkFiles/Regional_Health_Forum_volume_12_No_1_climate_change_and_its_impact

Arsenic Poisoning

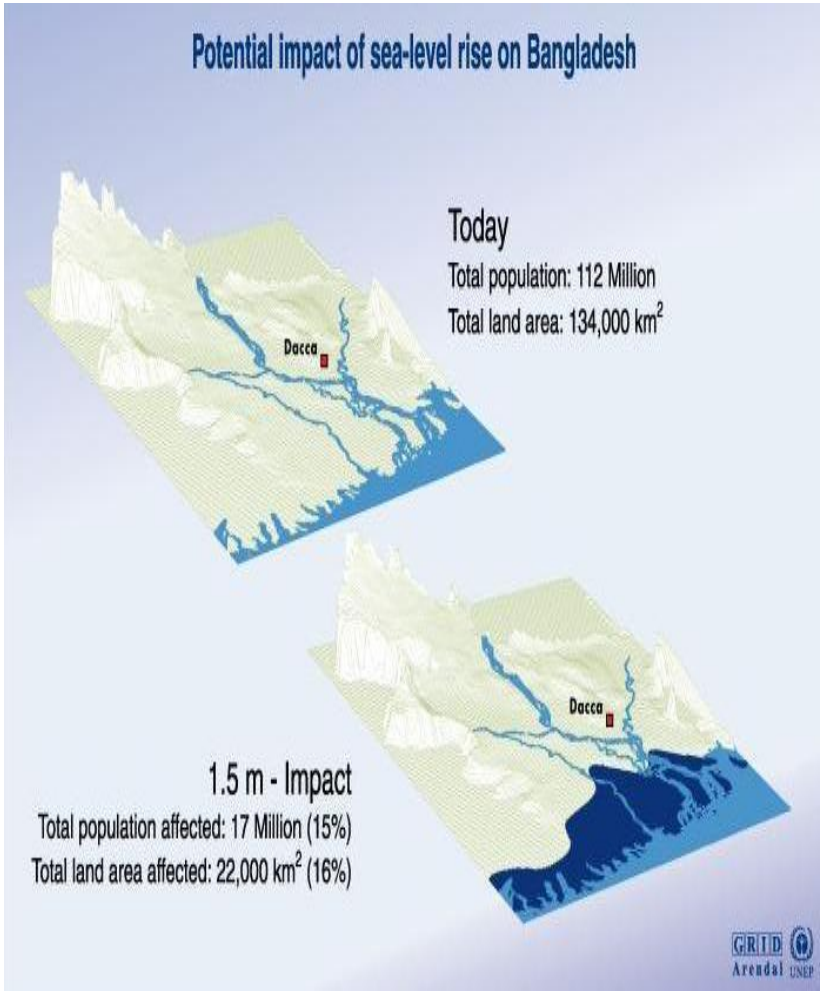
- World Health Organization described the arsenic contamination in Bangladesh as "the largest mass poisoning of a population in history".
- Half of Bangladeshis, up to 77 million people, have been exposed to the toxic arsenic (according to British Medical Journal "The Lancet")

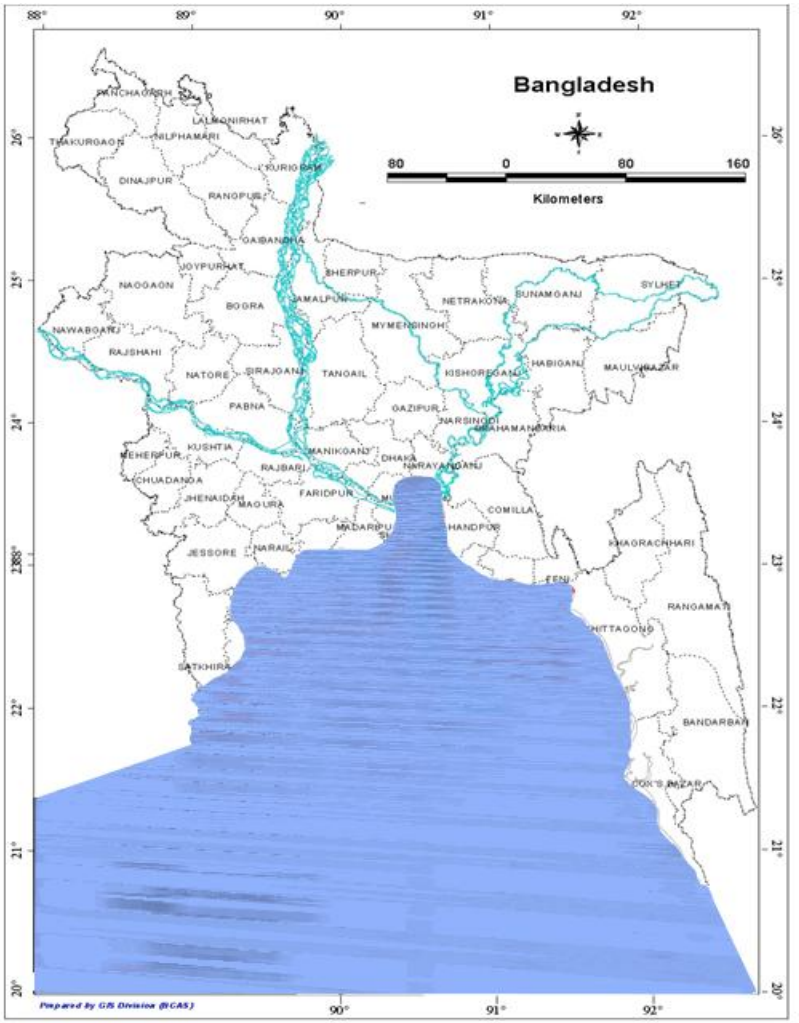

Arsenic Contamination In Bangladesh
Percentage of Contaminated Wells (Union level)
0 - 20
20 - 40
40 - 60
60 - 80
80 - 100

Impact of sea level rise on Bangladesh

- The coastal region covers almost 29,000 sq. km or about 20% of the country which is 30% of the cultivable lands. About 53% of the coastal areas are affected by salinity.
- Rising sea levels will wipe out more cultivable land in Bangladesh than anywhere in the world. By 2050, rice production is expected to drop 10 percent and wheat production by 30 percent. (IPCC Statistics)
- About 20 to 30 million people in Bangladesh alone could be on the move by 2050 because of climate change, causing the worst migration in human history.

Impact of sea level rise on Bangladesh





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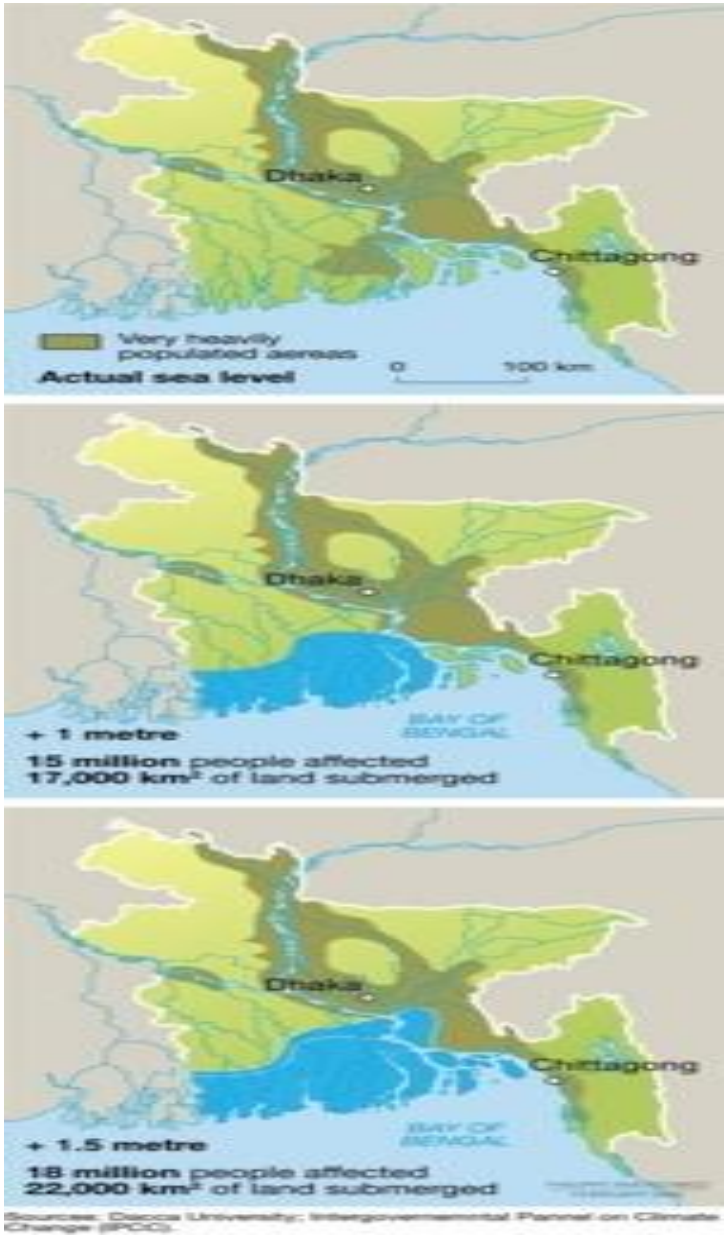
- If sea levels were to rise by the predicted amount of 2-3 ft then the effect on Bangladesh would be disastrous, loss of roughly one fifth (20%) of Bangladesh's landmass, displacing nearly 20 to 30 million people who will become environmental refugees (IPCC 2007)

(Source: UNEP, Vital Water Graphics, 2nd Edition, 2008)



Salinity affected areas in the coastal and offshore regions of Bangladesh

Description	Total cultivated area(ha)	Saline Area(ha)
Non-saline with very slightly saline	4,25,490	1,15,370 (27%)
Very slightly saline with slightly saline	4,20,420	3,09,190 (73%)
Slightly saline with moderately saline	2,57,270	2,40,220 (93%)
Moderately saline with strongly saline	1,98,890	1,98,890 (100%)

Source:http://www.pakbs.org/pjbot/PDFs/38(5)/PJB38(5)1359.pdf

Human Exposure and Tracks of Cyclones in Bangladesh

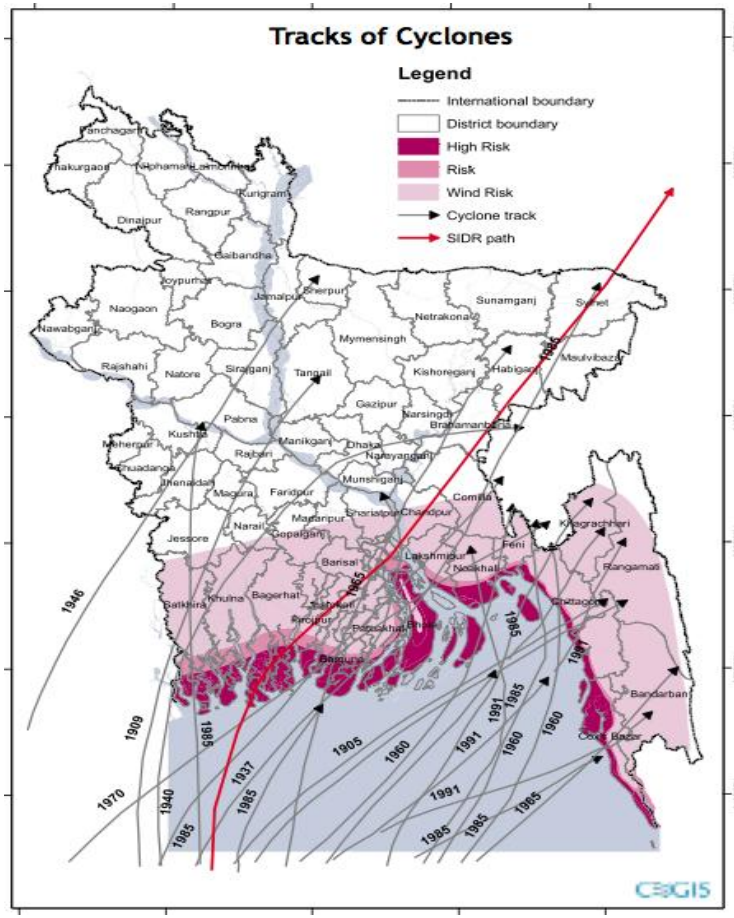
Human Exposure

Modelled number of people present in hazard zones that are thereby subject to potential losses.

Absolute human exposure

	Average people exposed per year	Country
1	22,548,120	Japan
2	16,267,090	Philippines
3	9,933,174	China
4	7,607,821	India
5	6,507,695	Taiwan, prov. of China
6	4,641,060	Bangladesh
7	3,573,351	United States of America
8	2,083,071	Korea (Rep. of)
9	1,885,541	Madagascar
10	872,234	Viet Nam
11	867,976	Myanmar
12	629,325	Mexico
13	602,264	Dominican Republic
14	488,556	Cuba
15	423,511	Hong Kong

Legend:
Tropical Cyclones (Saffir-Simpson categories)
Cat1 Cat2 Cat3 Cat4 Cat5

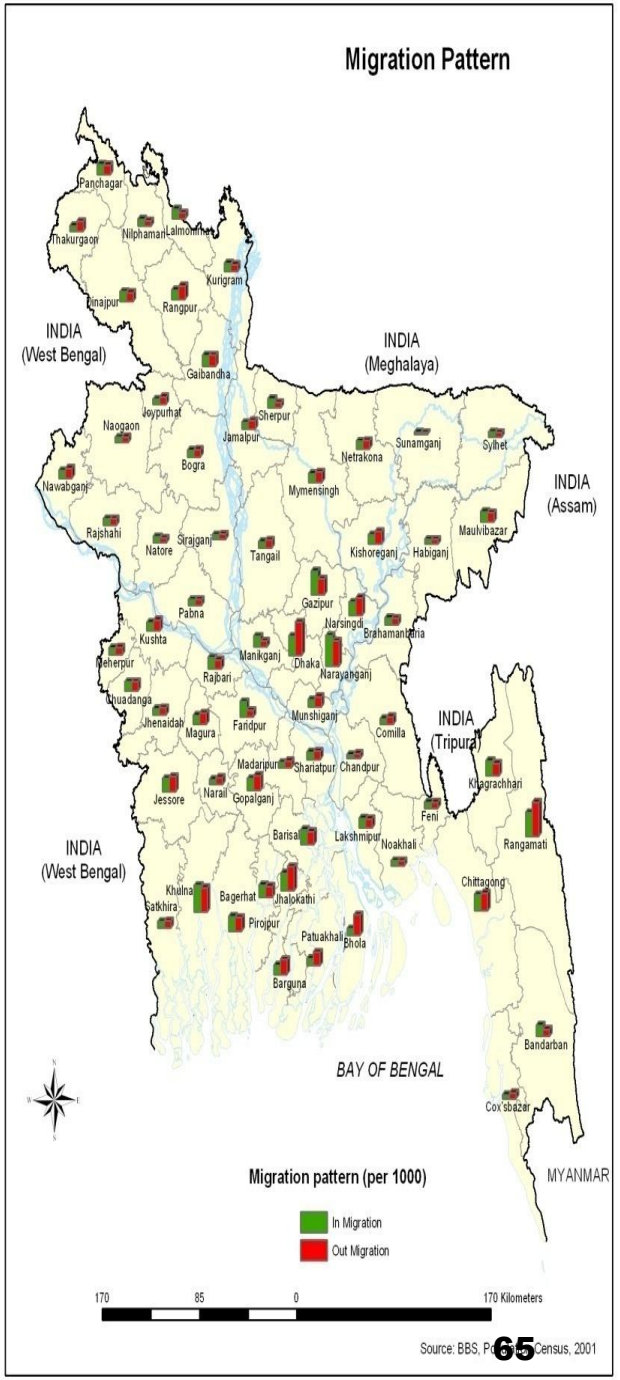


Source:
http://www.preventionweb.net/english/hazards/statistics/risk.php?hid=58

Climate Induced Migration

The potential impact of a destructive flood in Bangladesh that sent hundreds of thousands of refugees streaming into neighboring India, touching off religious conflict, the spread of contagious diseases and vast damage to infrastructure. Indicating the severity of the problem, the deputy assistant secretary of defense for strategy Amanda J. Dory commented that: "It gets real complicated real quickly."

-New York Times, August 8, 2009



Loss of Bio Diversity in Bangladesh

- Climate change induced natural calamities contribute to biodiversity loss
- Bangladesh is affected from both climate change and loss of biodiversity particularly in Sundarbans area, the most bio-diverse forest supporting around 40% of total biodiversity of Bangladesh.

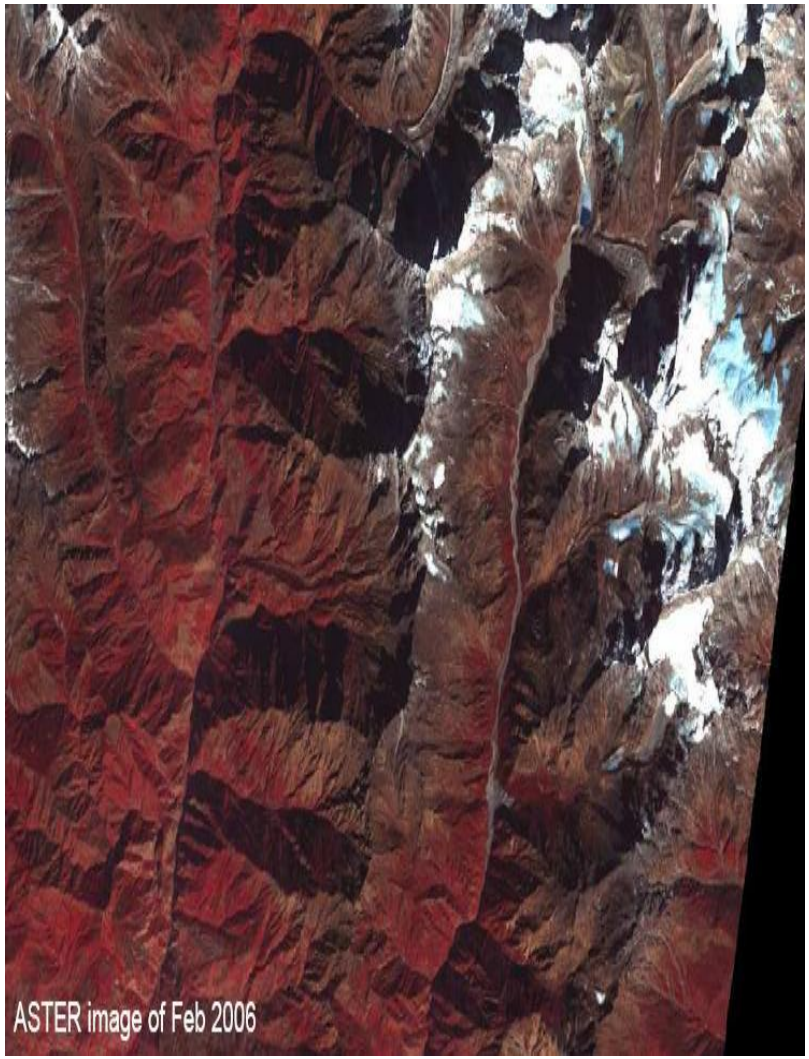
Regional Impacts: South Asia

- Himalayan glacier melting and impact over Indus river basin
- River management, water sharing and violent hydro-conflict
- Climate change and transnational terrorism
- Transvoundary Migration
- Vulnerability of the nuclear zone.

Glacier Melting

- Glaciers in the Himalayas are receding faster than in any other parts of the world.
- In Northwest China, 27% of the glacier area will decline by 2050 (equivalent to an ice volume of 16,184 km3), as will 10 to 15% of the frozen soil area.
- IPCC made a forecast that if current trends continue, 80% of Himalayan glaciers will be gone in 30 years.

Snow-cover Change in the Himalayas



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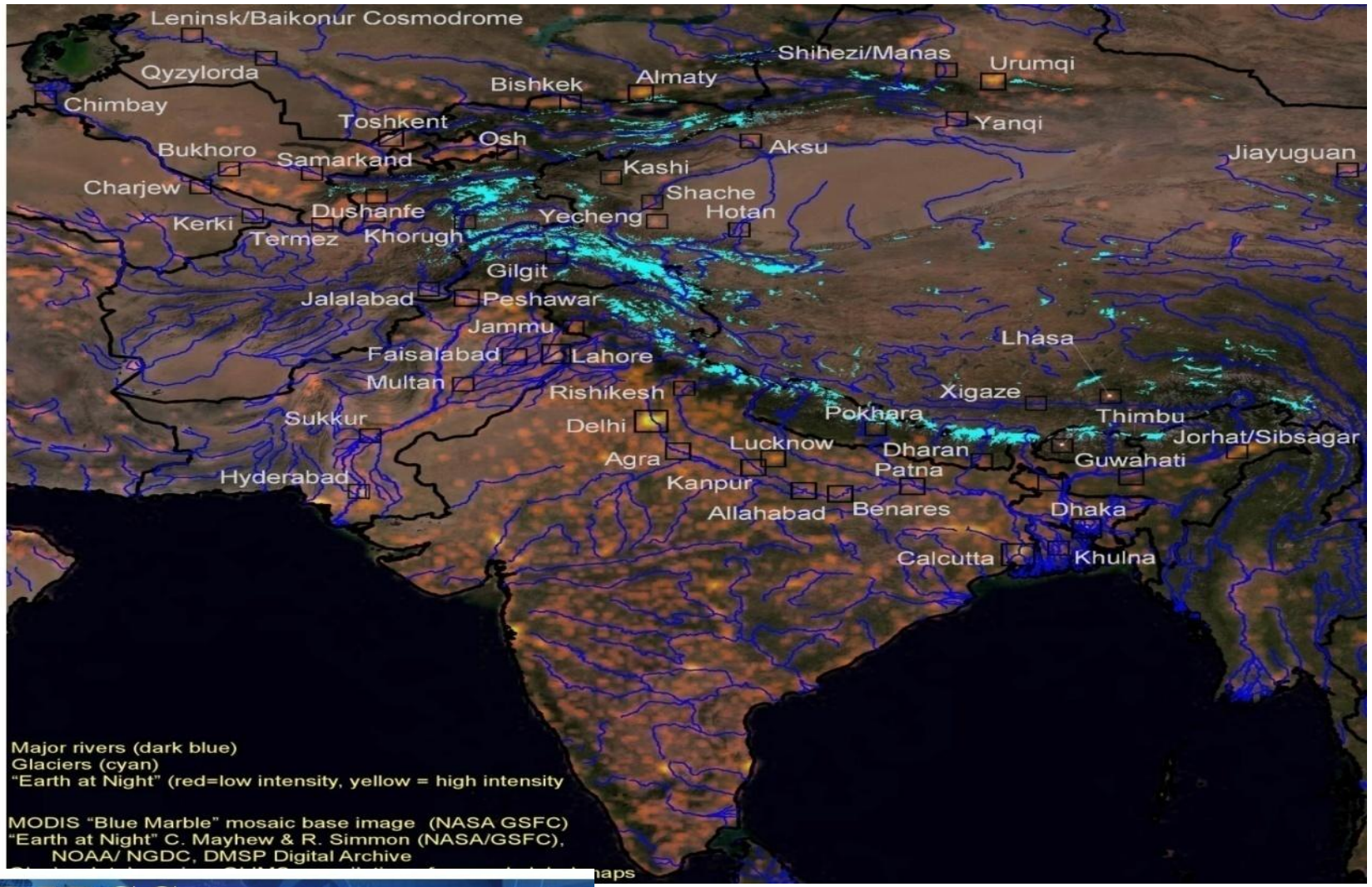
- The current trends of glacial melt suggest that the Ganges, Indus, Brahmaputra and other rivers across the northern Indian plain could likely become seasonal rivers in the near future.
- This poses a challenge for reducing the vulnerability of the more than 1.3 billion people living in the major river basins downstream from the Hindu Kush-Himalayan region.

Map of countries depending on Himalayan river basin

Map of the Himalayan River Basin Area



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	Area, sq km	Mean discharge (m^3/s)	% of Glacier melt in river flow	Population x1000	Population density	Water availability per person m3/year
Indus	1,081,718	5,533	44.8	178,483	165	978
Ganges	1,016,124	18,691	9.1	407,466	401	1,447
Brahmaputra	651,335	19,824	12.3	118,543	182	5,274
Irrawaddy	413,710	13,565	Small	32,683	79	13,089
Salween	271,914	1,494	8.8	5,982	22	7,876
Mekong	805,604	11,048	6.6	57,198	71	6,091
Yangtze	1,722,193	34,000	18.5	368,549	214	2,909
Yellow	944,970	1,365	1.3	147,415	156	292
Tarim	1,152,448	146	40.2	8,067	7	571
Total				1,324,386		

Source: Jianchu Xu et al. 2007

Current condition of the Himalayan River Basin Countries

- **The rapid retreat of the Himalayan glaciers has consequences for water-related hazards, such as glacier lake outburst floods, and for water stress, as a result of the decline in fresh water supplies during the lean season.**

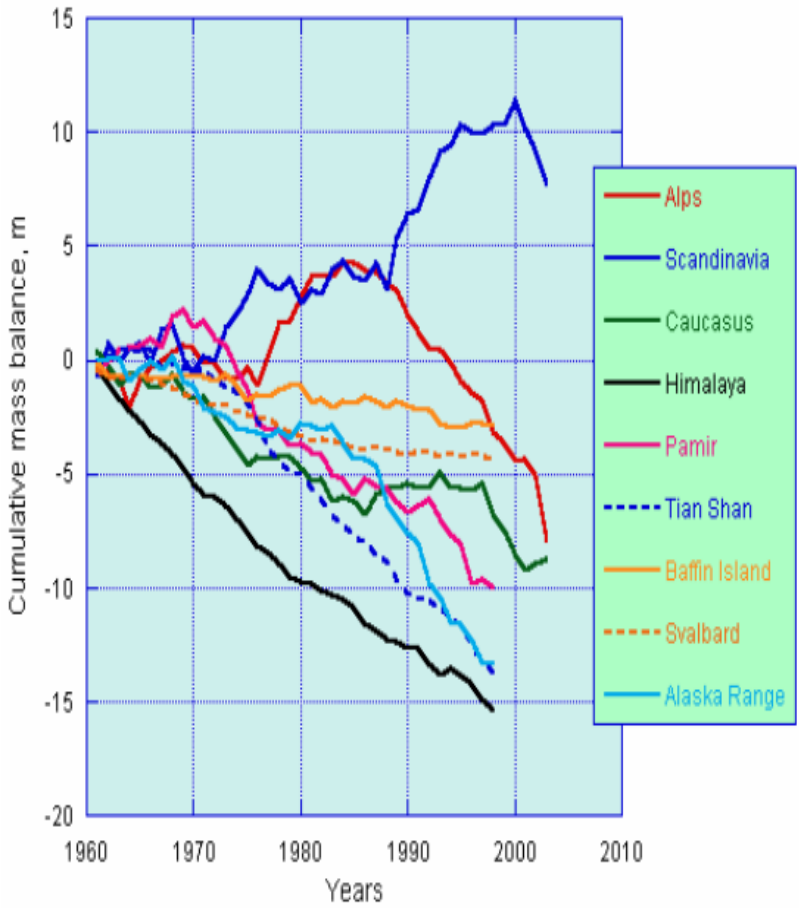


Figure 3: Rapid retreat of greater Himalayan glaciers in comparison to the global average (Source: Dyurgerov and Meier 2005).

Factors leading to cross-border water-related conflicts

Some of the critical indicators of vulnerability to conflict among nations related to water availability are :

- Per capita water availability,
- The level of water withdrawals for annual use in relation to its availability, and
- The extent of dependence on water resources that flow in from the borders.

Per capita water availability in 2000 and 2005 (cubic metres/person/ year)

Country	Basin Name	Population, Thousands	Per Capita Water Availability* 2000	Per Capita Water Availability* 2005
Afghanistan	Indus, Tarim	24,926	2,986	2,610
Bangladesh	GBM	149,664	8,809	8,090
Bhutan	GBM	2,325	45,564	40,860
China	GBM, Indus, Tarim	1,320,892	2,259	2,140
India	GBM, Indus	1,081,229	1,880	1,750
Myanmar	GBM	50,101	21,898	20,870
Nepal	GBM	25,725	9,122	8,170
Pakistan	Indus, Tarim	157, 315	2,961	1,420s

Source: FAO‟s AQUASTAT 2005

Availability: Total Actual Renewable Water Resources

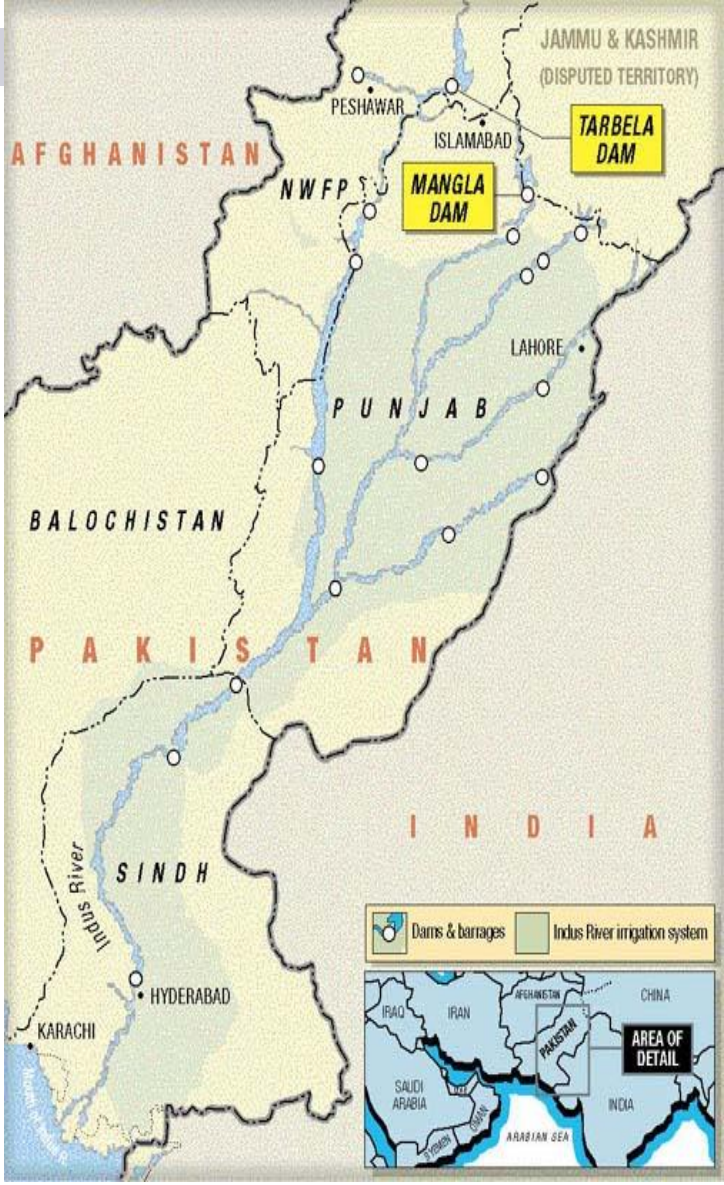
River Management and Violent Hydro-Conflict

- Water- related issues led to interstate tensions and significantly hampered development, such as along the Nile, Euphrates, Indus and Ganges rivers.
- The United Nations estimates 300 potential conflicts over water exist around the world today.
- water flow ignores political and community boundaries, decisions in one place affect water use elsewhere.
- In the case of shared river basins, water use upstream can affect downstream quality and quantity, thus creating the potential for conflicts of interest.

Indo-Pak Water Disputes

- **Concern is growing in Pakistan that India is controlling the water flow of rivers that flow from India into Pakistan, especially the Indus, Chenab and Jhelum rivers that pass through India's Jammu & Kashmir state.**

- **The Indus Water Treaty sets out the legal framework for the sharing of the waters of six rivers: Indus, Chenab, Jhelum, Sutlej, Beas, and Ravi - flow through northern India into Pakistan.**

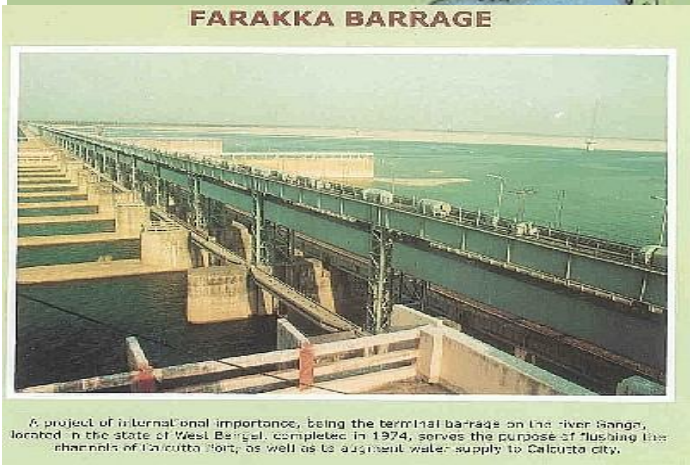


Indo-Pak Water Disputes

- **Pakistan has raised objections to Indian water projects.**
- **Pakistan is losing 13 million cusecs [approximately 368,119 cubic meters/second] of water every year from its rivers into the sea, as it does not have enough reservoirs or dams to store water.**

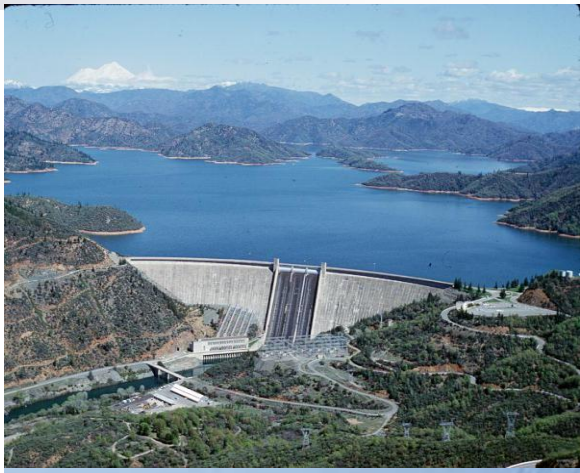
Indo-BD Water Disputes

- From independence, India takes exhaustive water surface management measures
- Diverts the Padma 18 km from future border
- 38 km canal feeding the Bhagirathi-Hooghly
- 1974 Unilateral diversions of water begin
- Supply more during the season that cause flood and less supply in dry season resulting in draughts.
- Construction of Dam: Tipai Mukh



Indo-BD Water Disputes (contd.)

- Acute ecological and social fallout in Bangladesh
- 1975 average dry-season, the average minimum discharge at the Farakka Barrage was 55,000 cubic feet/second
- 1995 Bangladesh records receiving 9,000 cubic feet/second during dry season shortage
- Saltwater intrusion, vegetation damage, erosion, reduced conveyance capacity, disrupted fishing
- Overall: major financial losses and losses of livelihood



Transboundary Migration

- Climate change induced migration is going to be in acute condition in South Asia.
- One third of the population live under poverty line and climate induced vulnerabilities may cause large scale impoverishment, loss of livelihood, shelter and food availability.
- Major disasters-flood, earthquake or cyclone may induce massive transboundaty migration.
- Intra-regional forced migration, such as those from Bangladesh to India is subject to stimulate bilateral tensions.




Climate Change and Terrorism

- South Asia – The epicentre of transnational terrorism.
- Climate changed induced vulnerabilities: radicalisation, ethnic conflict and violence
- Islamist militancy in Afghanistan, Pakistan, India and Bangladesh.
- Red Corridor – Naxalite Insurgency
- Different Brands of Religious Extremism – Hindu Radicalisation

Vulnerability of Nuclear Zones

Regional Cooperation in South Asia

Common Grounds?

- Interlocked by common geography and geology
- Common vulnerabilities.
- Natural disasters do not respect national boundaries.
- All major flood have their origin and consequence beyond one single country.
- Earthquake in the Himalayas are likely to affect more than one country.
- Countries have interest in collective pollution control, disaster management and cooperation.

Towards Regional Cooperation Mechanism

- Regional mechanisms such as South Asian Association for Environmental Cooperation, South Asia Cooperative Environment Programme (SACEP),South Asia Environment Outlook (SAEO), SAARC Natural Disaster Rapid Response Mechanism exist but hardly function.
- Regional environmental cooperation: collective and multi lateral approach.
- Regional Early Warning System-specific and relevant to the multi-hazard problem of the region.

Towards Regional Cooperation Mechanism (cont.)

- Adoption of Regional Policy to reduce the common Environmental Degradation
- Documentation and sharing of data, lessons from good practices
- A common meteorological greed
- Regional disaster management strategy
- Common regional plan for handling Himalayan glacier melting.
- Forward planning for migration control
- Regional environmental adaptation plan

Towards Regional Cooperation Mechanism (cont.)

- Common flood control and management mechanism
- Water Sharing and trans-border river management.
- Common Agreement to Lessen the Carbon Emission
- Common Energy Greed exploration
- Reducing the Communication Gap among the countries of the region about the event of the natural disasters
- Enhanced Political and Economic cooperation

Conclusion

- Common problems need common solutions
- Only cooperation among the countries of South Asia can reduce the imminent natural disasters and the consequent man made conflicts.
- Improved relations among the countries of the region and harmonisation of strategies and actions.

"It is undoubtedly true that development rarely takes root without security; it is also true that security does not exist where human beings do not have access to enough food, or clean water, or the medicine they need to survive...This is why the world must come together to confront climate change. There is little scientific dispute that if we do nothing, we will face more drought, famine and mass displacement that will fuel more conflict for decades."

-Barack Obama, US President

US President Barack Obama's Nobel Award Acceptance Speech

Questions and Comments

Thank You

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