

ADAPTATION: CONCEPTUAL ISSUES AND MAINSTREAMING CHALLENGES

Shardul Agrawala

OECD Environment Directorate

shardul.agrawala@oecd.org

*Thirteenth Asia-Pacific Seminar on Climate Change
Miyazaki, 2-5 September 2003*

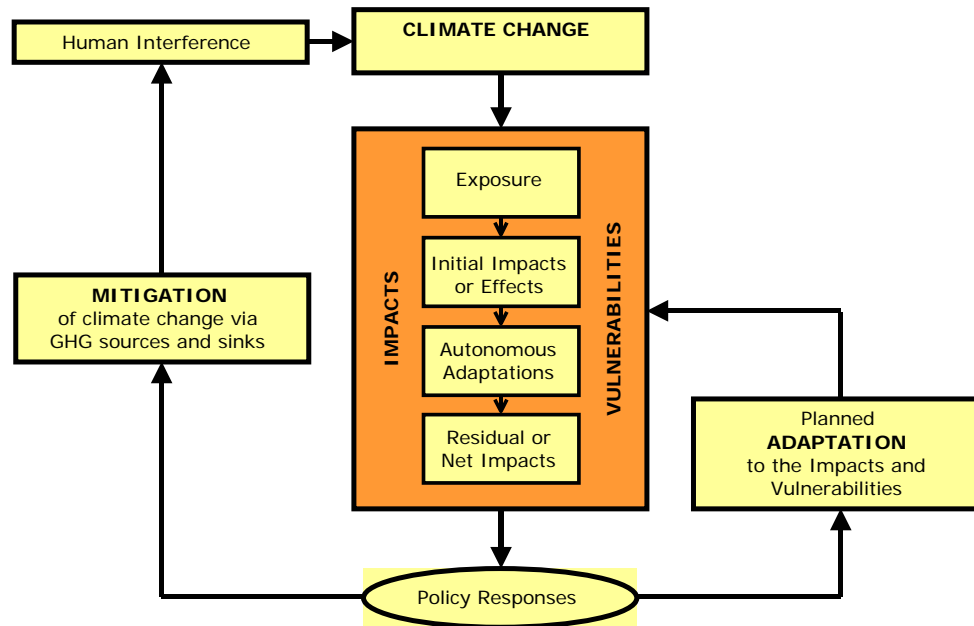
OUTLINE

1. **OECD and Climate Change**
2. **Issue Mapping**
 - **Key Concepts**
 - **Four stages in the treatment of adaptation in climate policy**
 - **Priority Theme #1: Mitigation/Adaptation Linkages**
 - **Priority Theme #2: Climate/Economic Development Linkages**
3. **OECD “Development and Climate Change Project”**
4. **Issues for Further Discussion**

1. OECD AND CLIMATE CHANGE

- Organization for Economic Co-operation and Development – IGO with 30 industrialized countries
- 4 OECD countries in Asia-Pacific region (+3 in N. America)
- “Think-tank” as opposed to a funding or implementation agency
- Target audiences for climate work: Member countries; UNFCCC process; IPCC (including AR4); Bilateral/Multilateral donors and developing country governments; research/policy communities
- Traditional climate change work on mitigation (Annex-1) issues – CDM baselines; Emissions Trading....
- More recent work on Development and Climate Change (OECD countries are principal providers of development assistance)

2. ISSUE MAPPING



IPCC 2001

2.1 Key Concepts

Adaptation: *Response, in natural or human systems, to actual or expected climate stimuli or their effects, which moderates the harm or exploits beneficial opportunities*

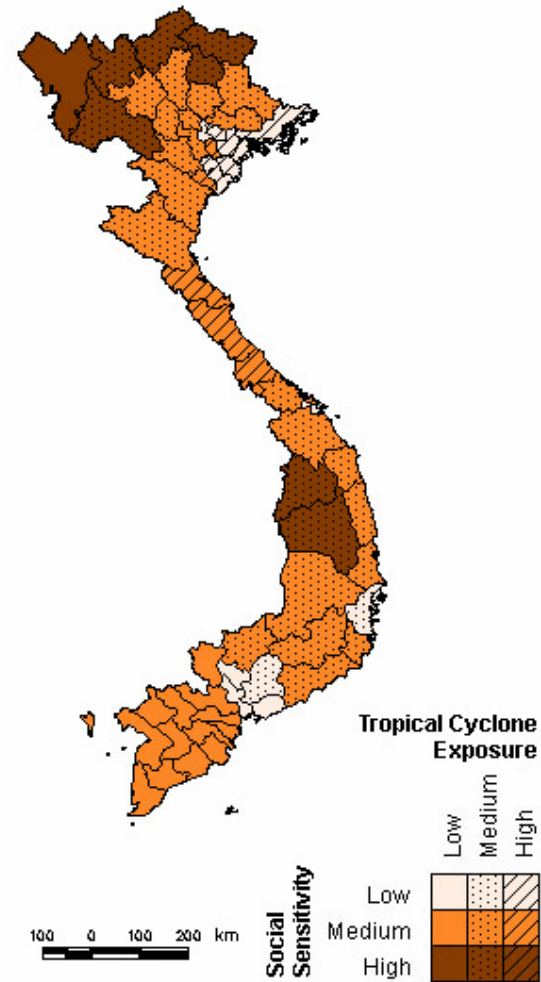
		Anticipatory	Reactive
Human Systems	Private	<ul style="list-style-type: none"> · Purchase of insurance · Construction of house on stilts · Redesign of oil-rigs 	<ul style="list-style-type: none"> · Changes in farm practices · Changes in insurance premiums · Purchase of air-conditioning
	Public	<ul style="list-style-type: none"> · Early-warning systems · New building codes, design standards · Incentives for relocation 	<ul style="list-style-type: none"> · Compensatory payments, subsidies · Enforcement of building codes · Beach nourishment
Natural Systems		X	<ul style="list-style-type: none"> · Changes in length of growing season · Changes in ecosystem composition · Wetland migration

IPCC 2001

Vulnerability = fn (Exposure, {Sensitivity, Coping Capacity})

Vulnerability has two sides: an external side of risks, shocks and stress to which a system is subject; and an internal side which is defenselessness, meaning a lack of means to cope with damaging loss (Chambers 1989)

Example: Vulnerability to Cyclones in Vietnam



Agrawala et al. 2001

➤ The goal of Adaptation is to reduce local/regional vulnerability by reducing sensitivity to climate risks

But.....

➤ Mitigation also can be viewed as reducing global vulnerability – through eventual reduction in magnitude of climate risks (although over long time-scales; and with no one-one correspondence)

➤ Non-climate policies – particularly Economic Development can also contribute to local/national vulnerability reduction – through reduction in baseline sensitivity (nutrition levels, health care, sanitation, communications infrastructure)

Adaptation, Mitigation, and Economic Development are all required – synergistically and/or independently

2.2 Four Stages in Treatment of Adaptation

- **1979 First World Climate Conference:** Climate Change requires reduction in energy sector emissions; Explicit focus on impacts and adaptation to climate variability
- **mid-1980s – mid 1990s:** Explicit policy spotlight on mitigation
- **Late 1990s:** (Re-) Emergence of Adaptation as a parallel issue; “New” IPCC TAR findings emphasizing adaptation to climate variability
- **2001- :** “Linkages”, “Synergies” between Adaptation and Mitigation; and between Climate Responses and Economic Development

2.3 Priority Issue #1: Adaptation/Mitigation Synergies

WHY NOW ?

- Even full implementation of Kyoto would delay climate changes only by about 6 years
- Developing country involvement in post-Kyoto-commitments
 - Developed countries would like developing country involvement in mitigation efforts
 - Developing countries more concerned about Vulnerability & Adaptation (and funding)

CURRENT POLICY DISCOURSE

“ Win-Win” – e.g. C-sequestration; Zero-tillage agriculture

SOME CONCERNS ABOUT CURRENT APPROACH

- Focus on synergies might exclude more promising (effective) adaptation or mitigation options that might not have such synergies.
- Adaptation and mitigation fundamentally cater to *different policy clients*, and are skewed towards *different spatial scales*

2.4 Priority Issue #2: Climate/Development Linkages

Two-way relationship between development and climate change

- Rate and path of economic development will affect ghg emissions and vulnerability to climate impacts
- Climate (variability and change) impacts affect path and rate of economic development

Climate Change activities are increasingly making a stronger link with development

CDM

National Adaptation Plans of Action (NAPAs)

At the same time Climate Change intersects key priorities on Sustainable Development and Development Assistance Agenda

WEHAB priority areas from WSSD

UN Millennium Development Goals (MDGs)

Poverty Reduction Strategy Papers (PRSPs)

Poverty and Climate Change (2003) - Heads of 10 development agencies recently affirm the significance of climate change to their development activities

But Several Troubling Issues Remain.....

- How to implement climate-led initiatives (CDM, NAPAs) ?
- How to assess degree of current attention to climate change in current development activities (policies and projects) ?
- How rank and prioritize climate change impacts for priority attention by the development community *at the temporal and spatial scales at which they make decisions* ?
- (When) Is climate impacts information robust enough for suitable incorporation in development plans and projects ?
- How to ensure policy coherence between development and climate policies of both donor and recipient governments ?

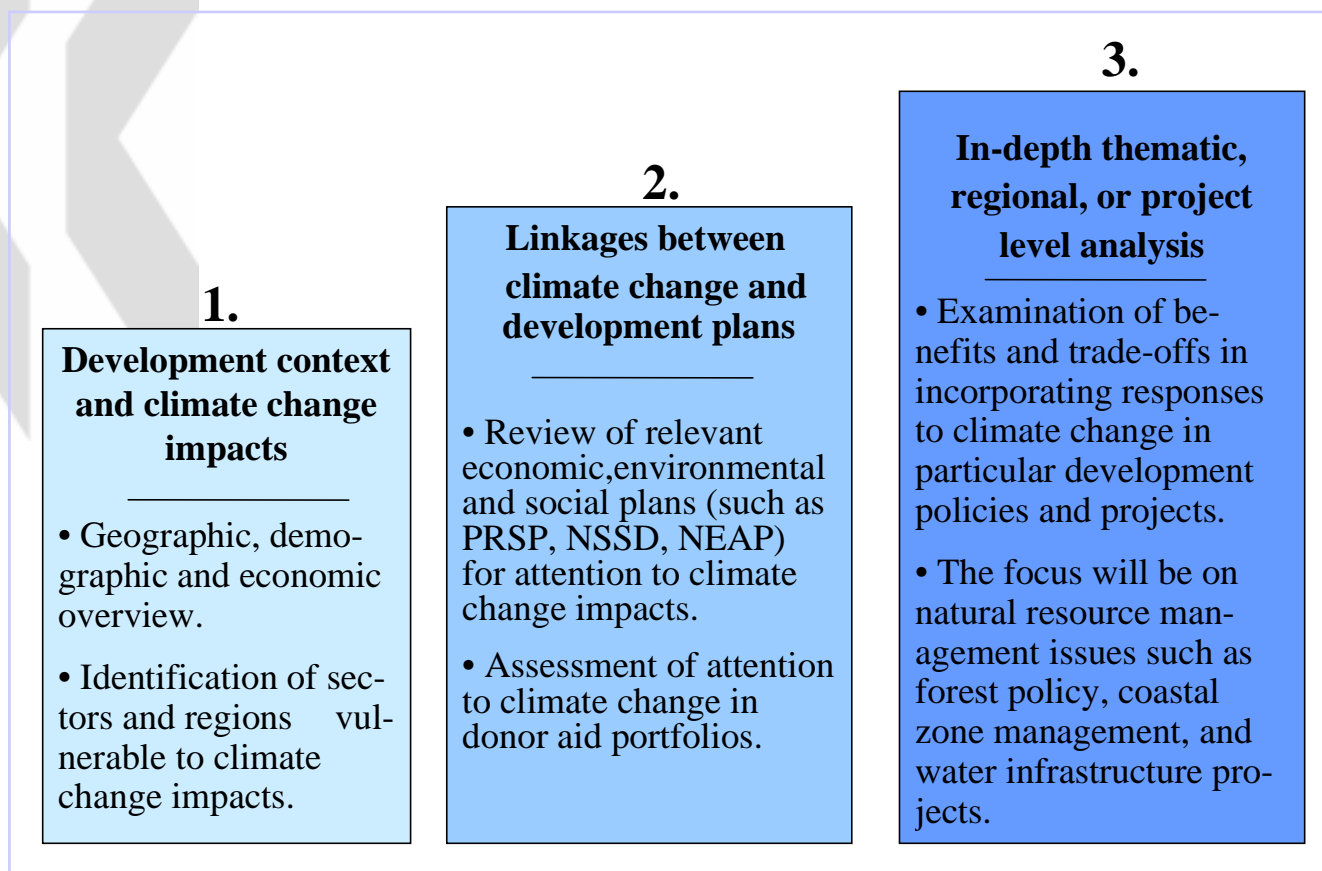
3. OECD Development and Climate Change Project

- **Overall objective:** To provide guidance on how to mainstream responses to climate change within development assistance and planning
- **Focus:** On links between climate change, natural resource management and economic development in developing countries. Primary emphasis on adaptation responses.
- **Case Studies:** Country case studies in *Bangladesh*, *Egypt*, *Fiji*, *Nepal*, *Tanzania*, *Uruguay*, and *Vietnam*

Case Study Countries

Country	Population	Area (km ²)	HDI rank	GDP	Illustrative climate impacts
<i>Island States:</i>					
Fiji	844,330	18,270	67	7,300	High percentage of the population affected by sea level rise, significant capital value at risk, loss of wetlands and mangrove fringes.
<i>Asia:</i>					
Bangladesh	131,269,860	144,000	132	1,570	Critical vulnerability to sea level rise due to low elevation and high population density. Impacts on wetlands and crop production.
Nepal	25,284,463	140,800	129	1,360	Significant melting of Himalayan glaciers (including on Mt. Everest), with major impacts such as bursting of glacial lakes, downstream flooding, and loss of tourism revenues.
Vietnam	79,939,014	329,560	101	1,950	Vulnerable to accelerated sea level rise, particularly in the Red River Delta in the north and in the Mekong Delta. Sea level rise threatens about 20,00 km ² as well as the cities Haiphong, Danang and Vungtau.
<i>Africa:</i>					
Egypt	69,536,644	1,001,450	105	3,600	Sizeable portion of the lower Nile delta threatened from sea level rise with implications on human settlements and agriculture. Economic sectors, especially around Alexandria also critically vulnerable. Irrigated agriculture inland might also suffer due to reduced water use efficiency as a result of significant projected increases in temperatures.
Tanzania	36,232,074	945,087	140	710	Mount Kilimanjaro ecosystem at risk from increase in fire risk and melting of the ice cap with attendant impacts on water resources. Coastal zones at risk of sizeable loss of land and beaches due to sea level rise.
<i>Latin America:</i>					
Uruguay	3,360,105	176,220	37	9,300	Critical sea level rise vulnerabilities in terms of wetlands loss and capital value with implications for tourism. Also offers an interesting case study on how carbon-sequestration is already being integrated with forestry, economic development, and agricultural policies.

Framework for Analysis



Quick Example: Nepal Case Study

National Climate Scenarios (2030, 2050, 2100)

- Based on MAGICC/SCENGEN analysis of 15 (post 1995) GCMs
- Comparison across GCM results reveals robust projections of continued temperature increase. Winter precipitation is uncertain, but monsoon precipitation shows a significant increase

Year	Temperature change (°C) mean (standard deviation)			Precipitation change (%) mean (standard deviation)		
	Annual	DJF ¹	JJA ²	Annual	DJF	JJA
<i>Baseline average</i>				<i>1433 mm</i>	<i>73 mm</i>	<i>894 mm</i>
2030	1.2 (0.27)	1.3 (0.40)	1.1 (0.20)	5.0 (3.85)	0.8 (9.95)	9.1 (7.11)
2050	1.7 (0.39)	1.8 (0.58)	1.6 (0.29)	7.3 (5.56)	1.2 (14.37)	13.1 (10.28)
2100	3.0 (0.67)	3.2 (1.00)	2.9 (0.51)	12.6 (9.67)	2.1 (25.02)	22.9 (17.89)

Select Observed Impacts in Nepal: Glacier retreat

- General retreat of glaciers (in some cases by as much as 10 m per year)
- Implications for **storage** and **variability** of water supply



Photos: DHM, Nepal

Select Observed Impacts in Nepal: Glacial Lake Hazards

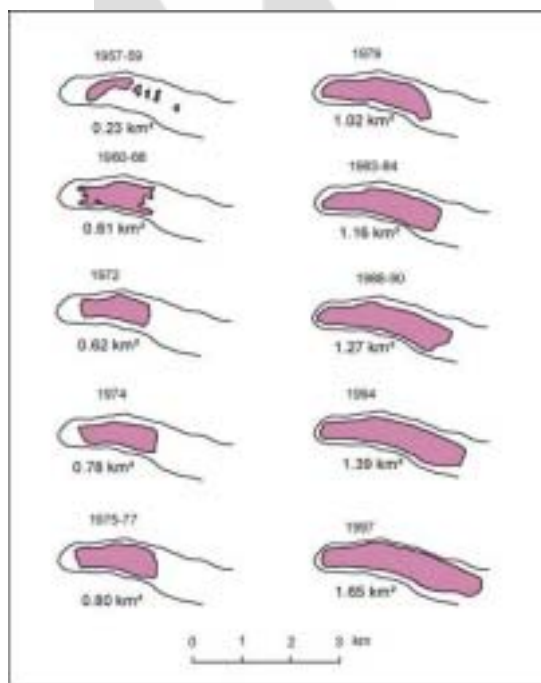


Figure 2.



Photo: DHM, Nepal

Other Projected Climate Change Impacts

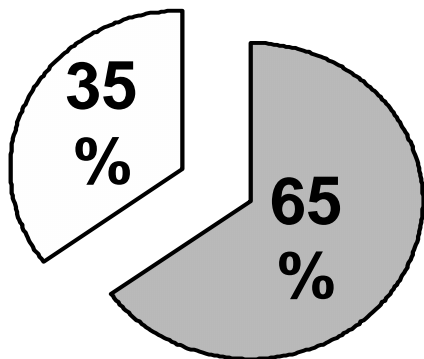
- **Decreased dependability of low flows**
- **Potential reduction in crop yields**
- **Potential spread of disease vectors**
- **Impacts on Ecosystems and biodiversity**

Nepal: Priority Ranking of Impacts and Vulnerabilities

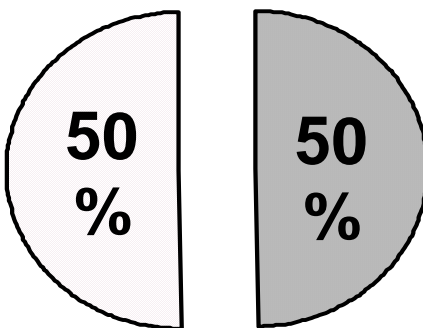
Resource/ranking	Certainty of impact	Timing of impact (urgency)	Severity of impact	Importance of resource
Water resources and Hydropower	High	High	High	High
Agriculture	Medium-low	Medium-low	Medium	High
Human health	Low	Medium	Uncertain	High
Ecosystems/Biodiversity	Low	Uncertain	Uncertain	Medium-high

Development Portfolios Potentially Affected by Climate Risks in Nepal (1997-2000)

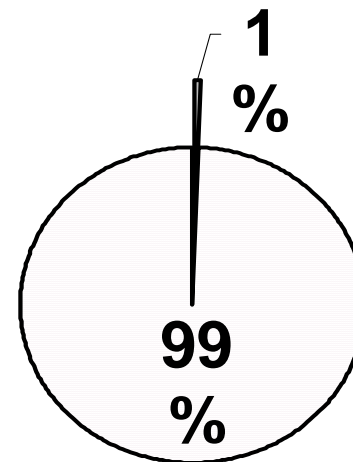
dark: affected by climate risks (high estimate)



dark: affected by climate risks (low estimate)



dark: emergency activities



Based on an analysis of the OECD Creditor Reporting System (CRS) database 50 - 65% of development activities totalling \$100 million by funding allocation (or 26 - 33% by number) in Nepal are potentially affected by climate risks

Amounts of activities			Activities affected by climate risks (high estimate)			Activities affected by climate risks (low estimate)			Emergency activities		
Donor	million\$	%	Donor	<i>million\$</i>	%	Donor	<i>million\$</i>	%	Donor	<i>million\$</i>	%
Total	959	100%	Total	623	100%	Total	476	100%	Total	6	100%
Germany	195	20%	Germany	173	28%	Germany	166	35%	Japan	5	89%
AsDF	187	19%	AsDF	119	19%	AsDF	119	25%	Switzerland	0.5	9%
Japan	148	15%	Japan	76	12%	UK	67	14%	UNDP	0.05	1%
UK	89	9%	UK	72	12%	Denmark	49	10%	Germany	0.04	1%
IDA	72	8%	IDA	60	10%	Netherlands	13	3%	Belgium	0.03	1%

Attention to Climate Risks in Strategy and Project Documents in Nepal

- Analysis of National Planning Documents (including Five Year Plans, Medium Term Expenditure Framework etc.) reveals a general lack of attention to climate risks. A key exception is Nepal's NSSD that lists climate change (particularly water related) impacts.
- Analysis of country strategies, as well as other documents of several bilateral and multilateral donors reveals a similar lack of explicit attention to climate risks.
- *However, adaptation to some key climate risks is being incorporated in some water projects – even though terms like climate change, adaptation are not explicitly used.*

Tsho Rolpa Risk Reduction Project



Photo: DHM, Nepal

Prioritisation and Mainstreaming of Responses

- High Level Meeting hosted by Department of Hydrology and Meteorology (DHM) in March 2003. High level participation from government agencies (Minister of Water Resources; Members of the Planning Commission; National Electricity Agency; Department of Hydrology and Meteorology; Agriculture, etc); Donors (GTZ, USAID..); and experts
- Stakeholders discussed mainstreaming issues, and ranked adaptation responses



Some Messages from Nepal Case Study

- **Climate change impacts already a development issue:**
 - **Loss of lives, infrastructure, and livelihoods**
 - **Reliability of energy and water supplies**
- **There are both synergies and conflicts: (i) among climate responses; (ii) between climate responses and other environmental concerns; and (iii) between climate responses and development priorities**

E.g.: One adaptation to Glacial Lake Floods is **micro-hydro** (diversified risk), which has synergies with rural development. However, adaptation to reduced low flow dependability requires **Storage Hydro**, which may exacerbate GLOF risks, and also be in conflict with environmental priorities.

Some messages from other Asia-Pacific case studies

➤ **Fiji:** High level policy attention to climate change risks among government (Strategic Development Plan, Nadi Communiqué on Investing in Adaptation...) and donors (WB Regional Economic Report..). Recognition of “no regrets” adaptation actions. Ongoing PIC dialog on mainstreaming.

BUT.... Lack of coherence between land-use and climate policies

E.g. Mangroves (a no regrets adaptation to sea level rise) effectively costed at only 5-10% of their value estimated in Fiji’s own Biodiversity Strategy Action Plan, and by World Bank and others, encouraging their conversion to agriculture and other land-uses.

Some messages from other Asia-Pacific case studies

➤ **Bangladesh:** Growing high level policymaker and donor attention to climate variability and change risks

Many key adaptations that climate change would require are already underway to cope with current vulnerabilities (sea walls, dredging of rivers to enhance flow, better disaster preparedness) as part of *ongoing development activity*. Does adaptation require anything different??

But... Operation and maintenance often underemphasized

Also, many climate change impacts (such as salinity increase in Sundarbans) are already artificially encouraged by local (sea water inundation for shrimp farming); and distant choices (water diversion upstream in dry season)

Additional Issues for Further Discussion

- How to view Adaptation/Mitigation Linkages (mutually exclusive, but integrated package; synergies only; synergies and conflicts) [Cross-cutting theme for IPCC AR4]
- How to reconcile Mainstreaming vs. Additionality – both for funding and project implementation
- Integrated adaptation strategies (NAPAs) vs. “tweaking” of development activity
- How to ensure that a focus on adaptation does not mask baseline stresses and policy distortions