

Challenges of Cost Effective Adaptation to Climate Change

Presented by:

Ravi Sharma

**United Nations Environment Programme
(UNEP)**

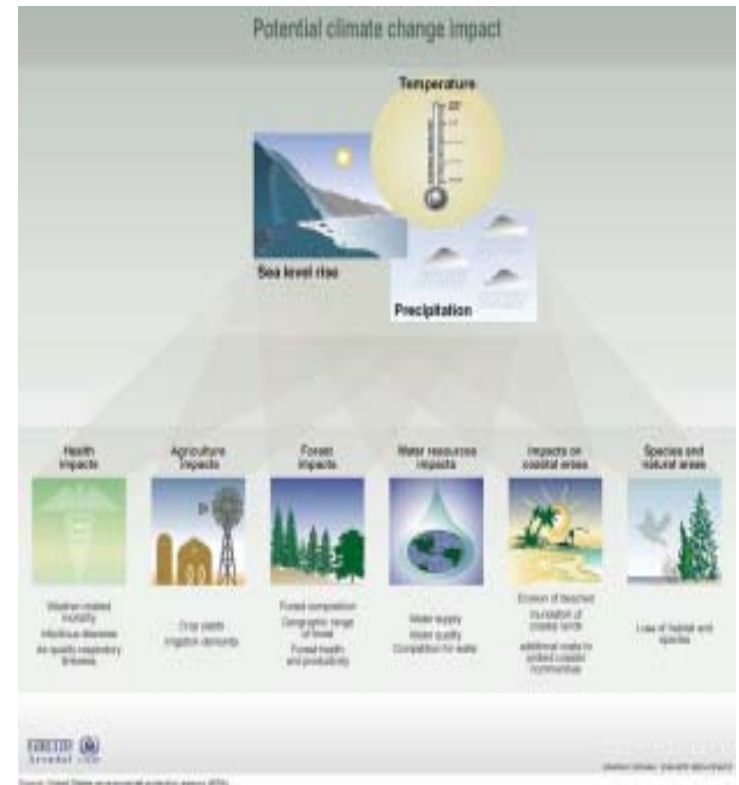
Eleventh Asia-Pacific Seminar on Climate Change

28-31 August 2001, Kitakyushu, Japan

POTENTIAL IMPACTS OF CLIMATE CHANGE IN ASIA- PACIFIC

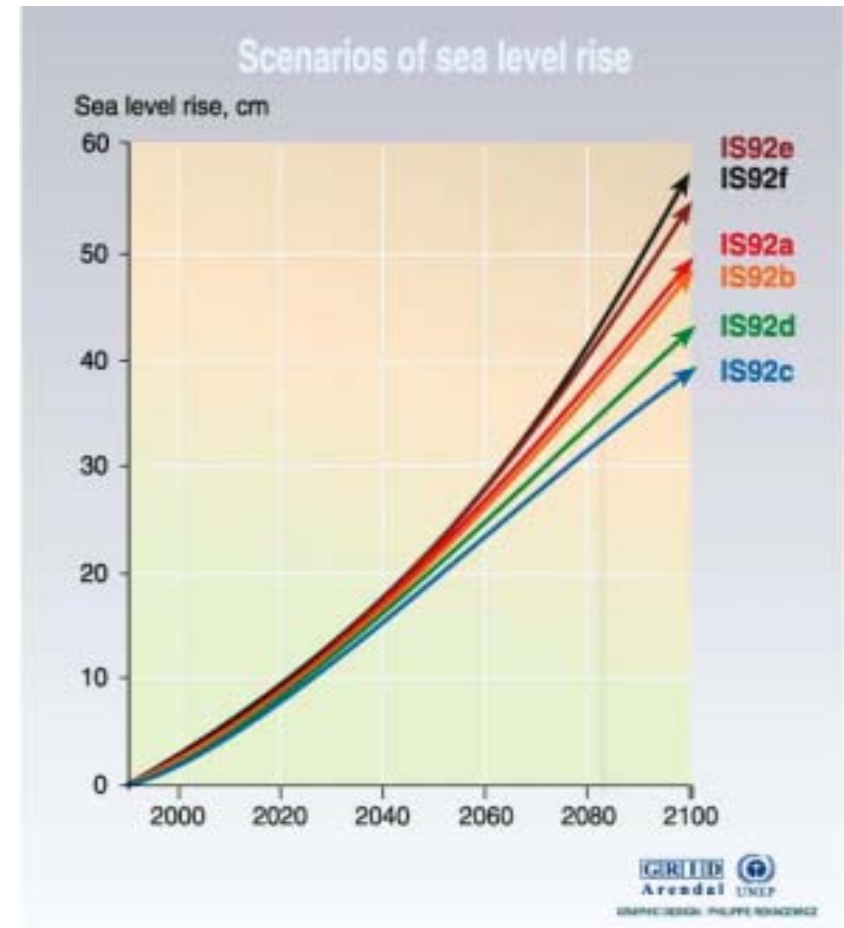
The following risks linked to changes in climate and variability are identified:

- The frequency of forest fires is expected to increase.



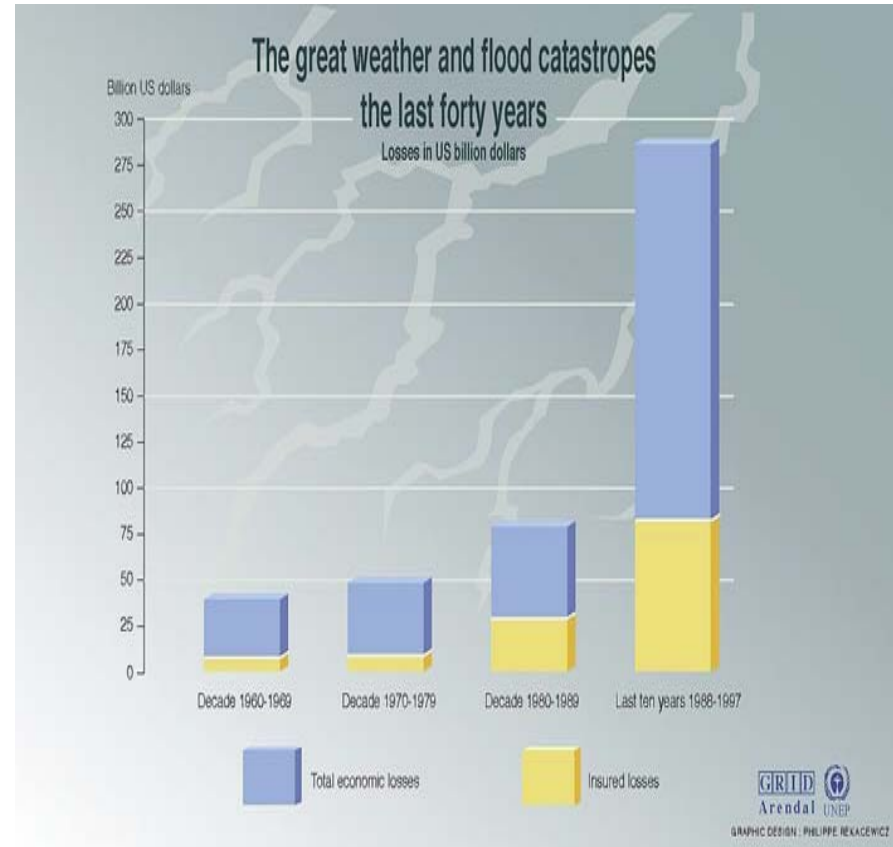
POTENTIAL IMPACTS OF CLIMATE CHANGE IN ASIA- PACIFIC

- The large deltas and coastal low-lying areas of Asia could be inundated by sea-level rise.



POTENTIAL IMPACTS OF CLIMATE CHANGE IN ASIA- PACIFIC

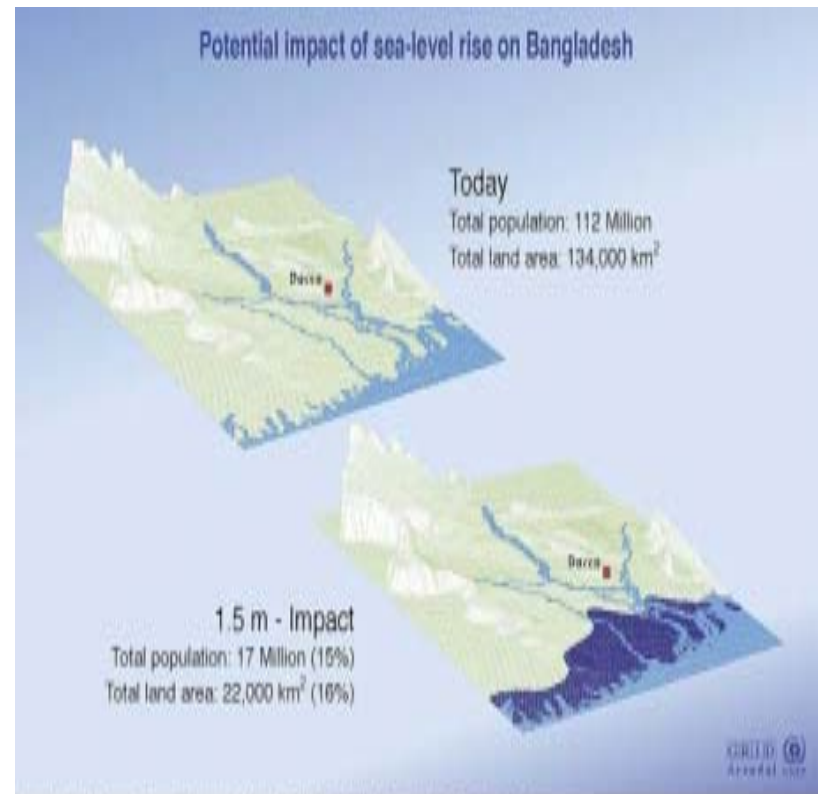
- Increased precipitation intensity, particularly during the summer monsoon, could increase flood-prone areas in temperate and tropical Asia.



Source: Munich Re Group, 1999.

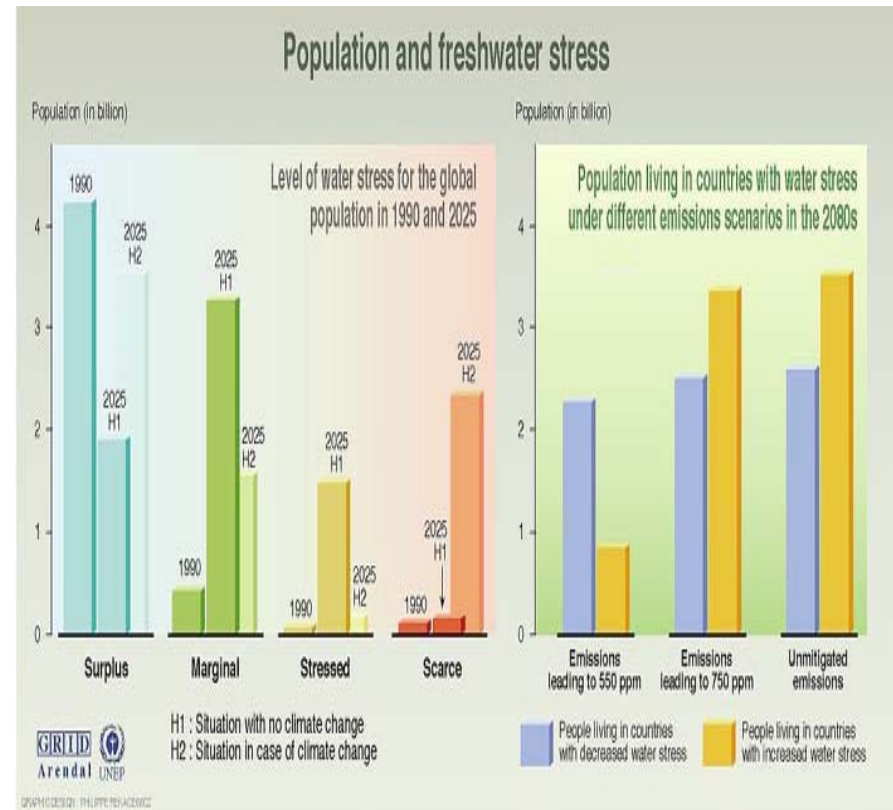
POTENTIAL IMPACTS OF CLIMATE CHANGE IN ASIA- PACIFIC

- Tropical cyclones could become more intense. Combined with sea-level rise, this impact would result in enhanced risk of loss of life and properties in coastal low-lying areas of cyclone prone countries of Asia.



POTENTIAL IMPACTS OF CLIMATE CHANGE IN ASIA- PACIFIC

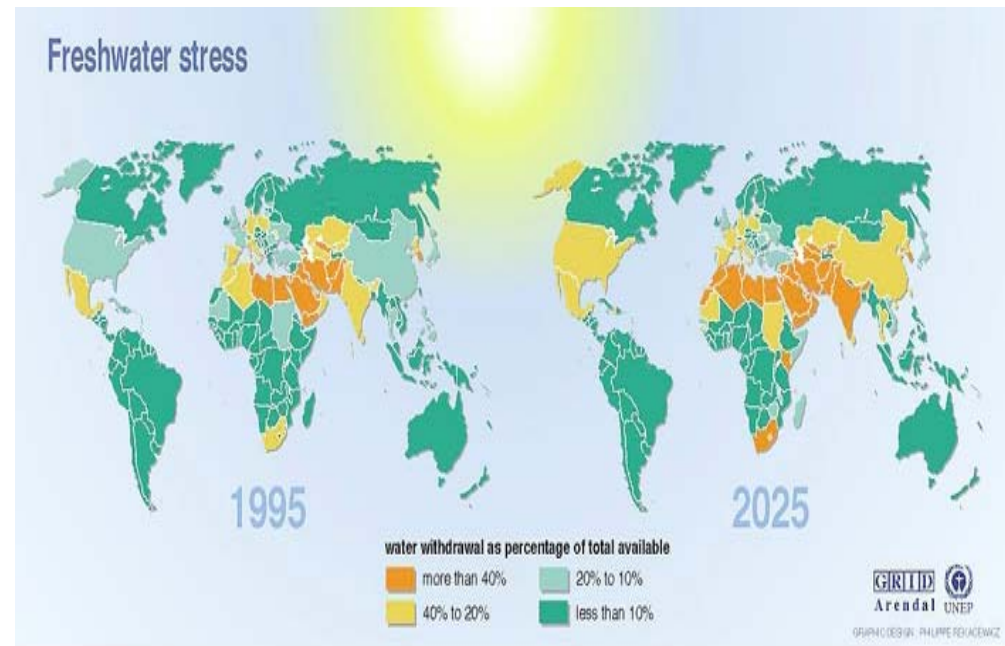
- Freshwater vulnerability is expected to be high to anticipated climate change.
- There is a potential for drier conditions in arid and semi-arid Asia during summer, which could lead to more severe droughts.



Sources: Climate change 1995, Impacts, adaptations and mitigation of climate change: scientific-technical analyses, contribution of working group 2 to the second assessment report of the intergovernmental panel on climate change, UNEP and WMO, Cambridge press university, 1996; Climate change and its impacts, stabilisation of CO2 in the atmosphere, Hadley centre for climate prediction and research, the meteorological office, London, 1999.

POTENTIAL IMPACTS OF CLIMATE CHANGE IN ASIA- PACIFIC

- Crop production and aqua-culture would be threatened by a combination of thermal and water stresses, sea-level rise, increased flooding, and strong winds associated with intense tropical cyclones.













Source: Global environment outlook 2000 (GEO), UNEP, Earthscan, London, 1999.


POTENTIAL IMPACTS OF CLIMATE CHANGE IN ASIA- PACIFIC

- Warmer and wetter conditions would increase the potential for a higher incidence of heat-related and infectious diseases in tropical and temperate Asia.

Spread of major tropical vector-borne diseases

Disease	Vector	Population at risk (million) ¹	Number of people currently infected or new cases per year	Present distribution	Likelihood of altered distribution
Malaria	Mosquito	2,400 ²	300-500 million	Tropics and Subtropics	
Schistosomiasis	Water snail	600	200 million	Tropics and Subtropics	
Lymphatic Filariasis	Mosquito	1,094 ³	117 million	Tropics and Subtropics	
African Trypanosomiasis (Sleeping sickness)	Tsetse fly	55 ⁴	250 000 to 300 000 cases per year	Tropical Africa	
Dracunculiasis (Guinea worm)	Crustacean (Copepod)	100 ⁵	100 000 per year	South Asia, Arabian Peninsula, Central-West Africa	
Leishmaniasis	Phlebotomine sand fly	350	12 million infected, 500 000 new cases per year ⁶	Asia, Southern Europe, Africa, Americas	
Onchocerciasis (River blindness)	Black fly	123	17.5 million	Africa, Latin America	
American Trypanosomiasis (Chagas disease)	Triatomine bug	100 ⁷	18 million	Central and South America	
Dengue	Mosquito	1,800	10-30 million per year	All Tropical countries	
Yellow Fever	Mosquito	450	more than 5 000 cases per year	Tropical South America, Africa	

1. Top three entries are population-pro-rated projections, based on 1989 estimates.
 2. WHO, 1994.
 3. Michael and Bundy, 1995.
 4. WHO, 1994.
 5. Ranque, personal communication.
 6. Annual incidence of visceral leishmaniasis; annual incidence of cutaneous leishmaniasis is 1-1.5 million cases/yr (PAHO, 1994).
 7. WHO, 1995.

 Highly likely  Very likely  Likely  Unknown

UNEP Responses

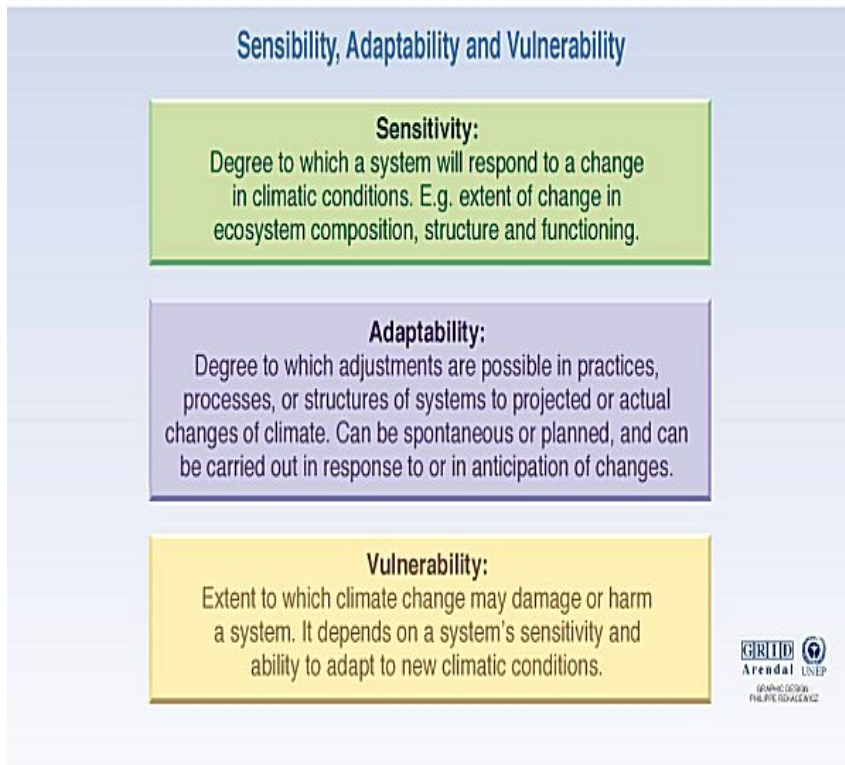
- Developing Vulnerability Indicators to Climate Change**
- Science and Technical Capacity in Developing Countries on Climate Impact and Adaptation Assessment**

UNEP Project on Vulnerability Indicators

- Many of the impacts of climate change are uncertain; equally, vulnerability is dynamic, continually changing as a result of various factors
- Adaptation strategies should promote responsive institutions that maintain a rich repertoire of policy options. Social resilience in the face of climate change should complement the aims of sustainable development.

UNEP Project on Vulnerability Indicators

Climate graphic n°25



- Vulnerability is a function of sensitivity to present climatic variability, the risk of adverse future climate change, and capacity to cope.

Why do we need information on vulnerability and adaptation?

- Long life span of greenhouse gases in the atmosphere.
- Adaptation is a necessity, and a precautionary approach is justified.
- Planning adaptation must begin with an understanding of vulnerable populations and regions.
- Vulnerability and adaptation are central to international policy on climate change in both UNFCCC and Kyoto Protocol.
- Composite vulnerability indices would be useful tools to help identify vulnerable situations and plan and monitor effective adaptation measures. The search for formal, quantitative indicators distinguishes this effort from current climate impact studies.

What are the issues and challenges

- Clear understanding of what indices will be used for, and by whom, is essential.
- At global level, composite index could determine eligibility for funds.
- At the local level, sectoral indices could be instrumental in designing and targeting projects.
- At the national (or regional) level, vulnerability indices would aid in planning adaptation strategies.
- A fundamental challenge is to link these scales.
- The quality and quantity of data required is a concern.

What is the way forward?

- Capacity building in vulnerability assessment and a process to develop quantitative indices of vulnerability.
- The process must ensure that resulting methodologies meet the needs of the UNFCCC, protocol and support work on Stage II Adaptation in the GEF.
- **Research gaps include**
 - linking local, sectoral and national composite indices;
 - understanding the cumulative effects of additional stresses;
 - providing relevant profiles of vulnerability; and
 - validating assessments.

A UNEP-GEF-IPCC Project

Assessment of Impacts and Adaptation to Climate Change in Multiple Regions and Sectors (AIACC)

- to build scientific and technical capacity in
developing countries**

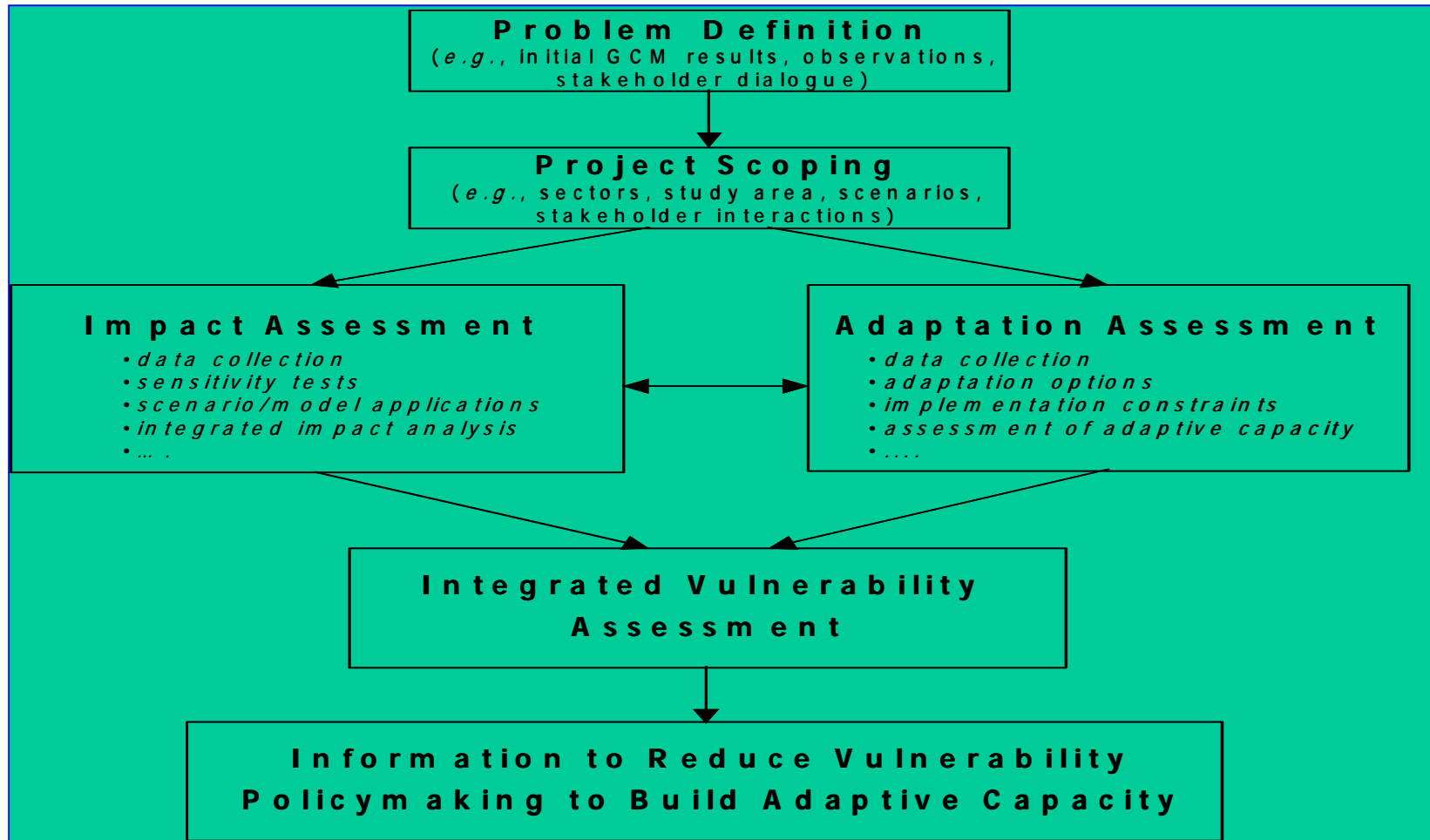
AIACC Description

- Fund research activities up to US\$ 300,000 for 3 years to assess the impact of climate change on a range of socio-economic sectors and ecological systems at the regional and national scale.
- Fund development of a range of adaptation response options.
- Project has started early this year, and we received more than 140 pre-proposals.
- START and TWAS are the two implementing agencies for the project.

AIACC Outputs

- IPCC
 - Input to the Fourth Assessment Report.
- UNFCCC
 - Input to the national communications.
- Filling Research Gaps identified in IPCC TAR

AIACC



Team/Resources

- Resources allocated to AIACC
 - Technical Committee.
 - Steering Committee.
 - START and TWAS.
 - IPCC support.

AIACC Selection Criteria-1

- **Relevance** (pass/fail)
 - Impacts, adapt. & vuln.
 - Variety of methods
- **Scientific Merit** (30)
 - Clear definition
 - Information gaps.
 - Work plan
 - Appropriateness
 - Futures
 - Priority sectors/issues
 - Evidence
- **Multi-country** (10)
 - Integrated approaches
 - Multi-country or replicable single country projects
- **Adaptation** (20 points)
 - Mechanisms for coping
 - Remove barriers
 - Cost effectiveness, benefits
 - Comparison of the capacity
 - Analysis/modeling
 - Effects on adaptive capacity
 - Compatibility

AIACC Selection Criteria-2

- **Relevance** (20)
 - Information for stakeholders and policymakers
 - Strategies to seek input
 - GEF focal pt. endorsement
- **Capacity Building** (10)
 - Enhancement of scientific and technical capabilities
 - Development of databases, scenarios, models
 - Enhancement of stakeholder capacity
- **Project Management** (10)
 - Appropriate project team
 - Work plan
 - Strategy for reporting
 - Budget consistent with work
 - Potential co-financing identified.

Accepted Asia Pre-proposals-1

Focus Sector	Countries
Agriculture (rice)	Bangladesh
Monsoon variability, groundnuts	South Asia, India
Plantations (coconut, tea)	Sri Lanka
Agriculture	NW India
Multisector, sustainable livelihoods	Bangladesh, India, Pakistan
Multisector, rural communities	Bangladesh
Coastal, infrastructure	India

Accepted Asia Pre-proposals-2

Focus Sector	Countries
Agriculture, variability	Pakistan
Water	Mekong basin (China, Laos, Myanmar, Thailand, Cambodia, Vietnam)
Multisector	Philippines, Indonesia
Grasslands, agriculture, water	Mongolia
Regional climate modelling, hydrology, vegetation	Western China
Multisector	Western China
River runoff, water management	Kazakhstan, China, Yellow River Delta

Contacts

Monitoring and Evaluation

Ravi Sharma

Task Manager AIACC

**Division of Policy Development
and Law**

**United Nations Environment
Programme (UNEP)**

**P.O. Box. 30552, Nairobi
Kenya**

Tel: +254 2 624215

Fax: +254 2 624324

Email: ravi.sharma@unep.org

Submit proposals

Neil Leary

AIACC Science Director

**International START
Secretariat**

Washington D.C.

USA

Tel: +1 202 4622213

Fax: +1 202 4575859

Email: aiacc@agu.org