Adapting to Climate Change and beyond:
Issues for developing Countries

Srikantha Herath

Senior Academic Programme Officer

Global Change and Sustainability Programme

United Nations University

Institute for Sustainability and Peace

October 28, 2009

Needs of developing countries in responding to climate change

- Based on the level of development, and the lcocal conditions, climate change concerns will be different for different countries.
- Climate change is going to have the biggest impact on the least developed countries and adaptation to change is their priority.
- For the rapidly developing countries the challenge is on meeting huge energy demands to support the economic expansion, while containing emissions.

Issues for least developed countries

- Developing countries are the most affected from CC, although they have the least contribution to GHG emissions.
- They depend heavily on agriculture and the poorest are engaged on it. Agriculture and water sectors will be the most critical sectors for DC.
- Increase of CO2 will have a positive impact due is increased photosynthesis. However, with time, high temperatures and irregular rain will have a negative impact on the agriculture production.
- 60% developing countries' food comes from 80% of arable land without irrigation - vulnerable to CC.

Issues for Developing countries

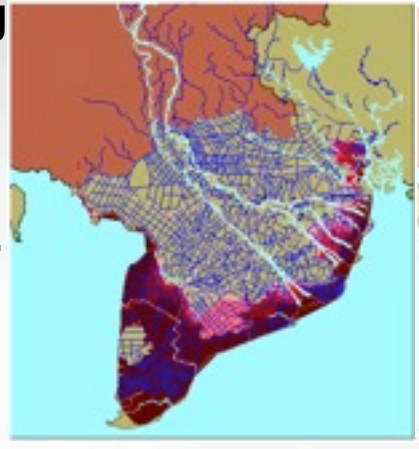
- Water scarcity to increase due to agriculture demands
- Mega deltas affected by Sea Level Rise
  - Salinity Intrusion affects agriculture and water supply
  - Risk of extreme floods can increase dramatically

Viet Nam

Salinity ranking

- < 1 g/L
- 1 - 4 g/L
- 4 - 15 g/L
- > 15 g/L

Source: Text Text SIWRP, 2008



Year 2000

SLR 100 cm

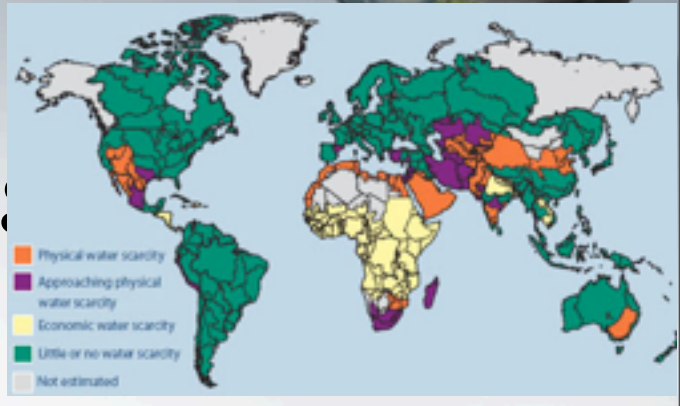
Source: IMHEN 2009

SLR: 0.65 m
Inundation: 5130 km² (13%)

SLR: 1.00 m
Inundation: 15100 km² (38%)

Issues: Water too little & water too much

- Water scarcity will increase due to increase in consumption and increasing economic activities
  - Rainless periods will increase in climate change scenarios
- Flood losses are increasing globally, due to increased exposure and other drivers, notably urbanization.
  - Rain intensities will further increase due to climate change making flood problems more difficult to cope up

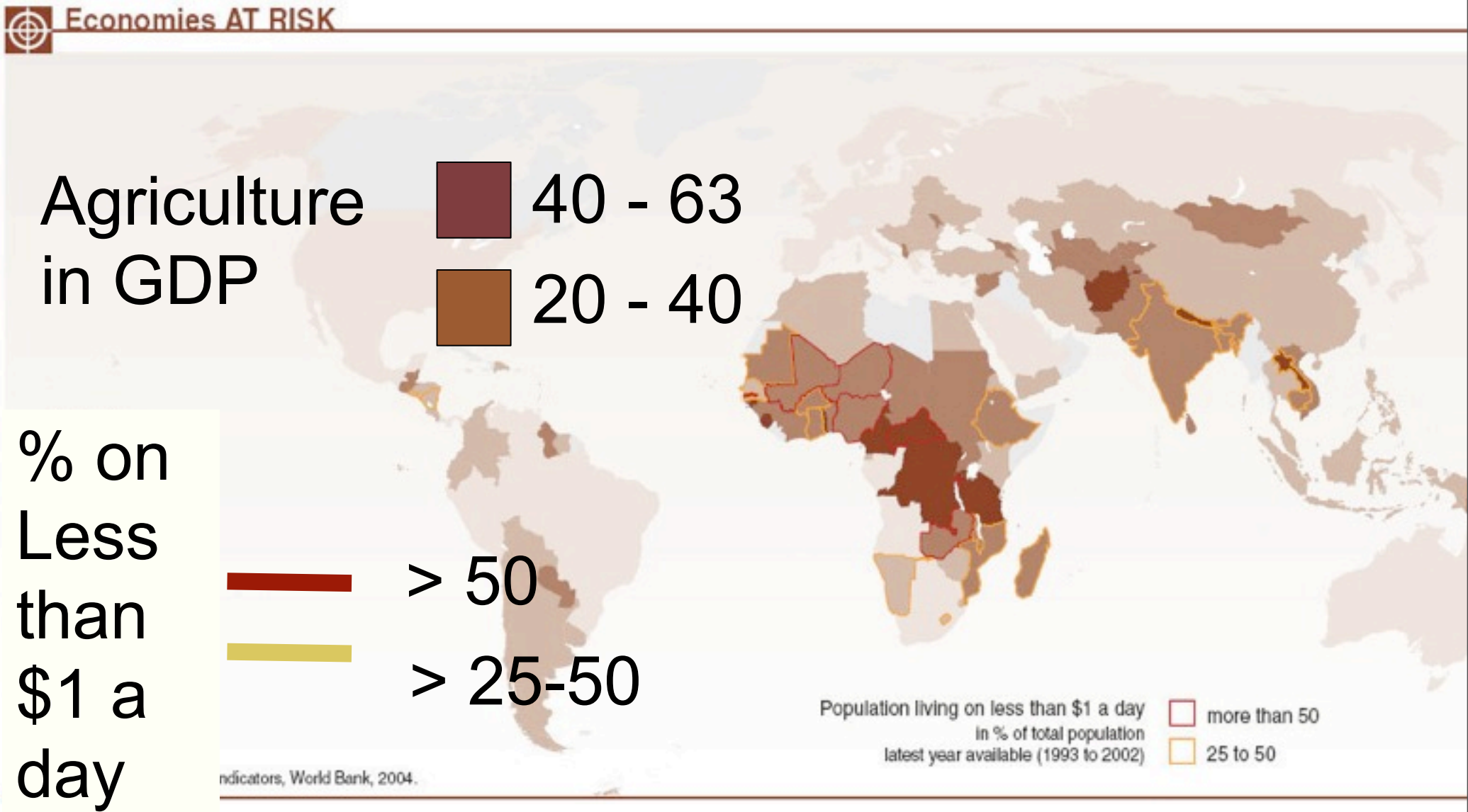


Water Scarcity: UN-Water 2007

Physical WSc
Approaching Ph.WSc
Economic WSc

Water Dependency Ratio

Agriculture and Poverty



High degree of dependence on agriculture is closely related to poverty

Coping Capacity

- Small farm owners are have the least capacity to cope up with climate change. Resilience is low as surplus income is low.
- Farmers are used to climate variability, especially in the tropics, where inter-annual rainfalls could vary by 2-3 times.
- However, they experience a gradual decline of weather conditions favorable to farming, in addition to variability.
- Water resources, suitable crop varieties, alternative livelihoods, are some of the options that need to be considered as adaptive measures.

Victims of Climate change

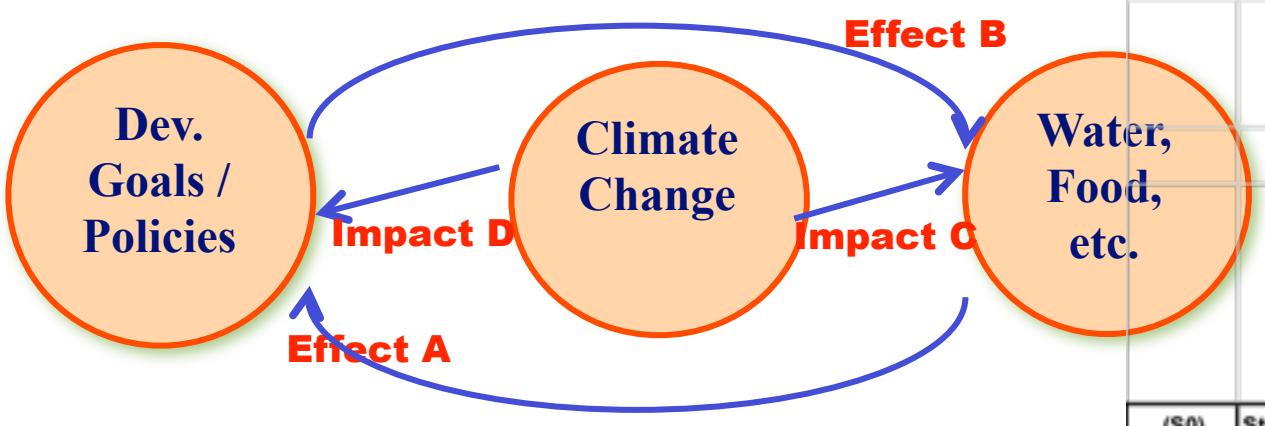
- Climate change is environmental as well as a political challenge
- April 2007, UN Sec. Council on climate change.
- Yoweri Musevini (2007, AUS) President of Uganda, Climate change is an act of aggression by the developed world against the developing world. Demanded compensation for the damage global warming would cause African nations.
- Kaire Mbuede (2007) Namibian representative to the United Nations, "developing countries, in particular, had been subjected to what could be described as "low intensity biological or chemical warfare".
- Need to develop pragmatic programs for adaptation and mitigation to effectively respond to climate change challenges.

Moving forward

- Adaptation is a local issue
  - Depends on geographical, climatic, bio-physical as well as socio-economic characteristics
  - While impacts are local, benefits of adaptation investment are also local (different from mitigation)
  - Climate change increase impacts on existing vulnerabilities
- Adaptation is a development issue
  - Build climate resilience in development planning
- Has to be different from present ODA practices.
- Solutions should evolve locally considering local socio-economic and environmental conditions.
- Developing local capacity for this, supported by the global knowledge and experience is the key concern.

Designing adaptation measures

- How to assess 'Climate Only' impacts?



Impact Action Matrix method (IAM) shows the complex relations among development goals and impacts on different sectors.

Solutions: Long term & Local

- How to prioritize measures and avoid 'mal adaptation'?

Effects of Water Using Sectors on Development (WED-AIM) in SL with CC

		Vulnerability, Impacts & Adaptation (VIA) in Water Using Sectors				
		(1)	(2)	(3)	(4)	
		Agriculture	Hydro Power	Water for Humans (Esp. Poor)	Water for Bio- & Eco-logical Res.	Row Totals (With CC)
(S0)	Status (No CC impacts)*	-1	0	-1	-1	
(S1)	Status (+CC Impacts =>)**	-2	-1	-3	-2	
=> Dev. Goals/Policies (+CC Impacts)						
(A)	Growth	-3	-1	-2	-2	-8
(B)	Poverty alleviation	-2	-1	-3	-1	-7
(C)	Food Security	-3	-1	0	-1	-5
(D)	Employment	-2	0	-1	-1	-4
(E)	Trade & Globalisation	-1	-1	0	-1	-3
(F)	Budget Deficit Reduction	-1	-1	-1	-1	-4
(G)	Privatisation	0	0	0	-1	-1
Column Totals (With CC)		-12	-5	-5	-7	

Designing adaptation strategies

- Effective and feasible adaptation strategies would differ by sector, nature of impacts, such as rapid on set of extreme events or creeping changes as crop yield reduction.
- Considerable amount of research and studies need to be done to clarify appropriate approaches as well as methodologies for mainstreaming adaptation into development.
- Need to establish international support for implementing agencies and research institutions to lead national adaptation strategy development and rapid transfer of research and current knowledge to practice.

Concerns of rapidly developing countries

Bank Analogy

- Contribution to mitigation based on ability to pay and past use - bank analogy - Prof. Kirk Smith, published by UNU more than a decade ago

(total emissions since 1950, billions of tons) – from Micheal Glantz, NCAR

Ability and Responsibility to pay

- Contribution to mitigation based on ability to pay and past use
- Bank analogy - Prof. Kirk Smith, published by UNU more than a decade ago
  - Borrow from the global environment to support development. Return after the development, so that others can use the same environmental services
- Pragmatic measures have to be developed to meet the mitigation challenges by rapidly developing countries
- Sharing clean energy technologies, joint development of new appropriate technologies would be the key requirements.

Need to integrate Research, Capacity Development and Applications for adaptation and mitigation

- Higher Education Research on CCA & M
- Collaboration among operational agencies and research programs: identifying data, needs, national plans, etc.
- Field Stations for research and supporting projects for application/verification
- Capacity development programs for training a large number of competent persons.

National training programs for researchers and practitioners

Supporting Post graduate Research

Demonstration Project

Training of trainers

Dissemination of results to policy makers

University network for Climate and Ecosystems Adaptation Research (UN-CECAR)

UNITED NATIONS UNIVERSITY
UNU-ISP

United Nations University
Institute for Sustainability and Peace

Google™ Custom Search

日本語

- Global Change & Sustainability
- Peace & Security
- International Cooperation & Development
- Capacity Development

UNITED NATIONS UNIVERSITY

Climate Change
unu.edu/climate

UNU supports research on the causes and effects of global warming, the development of viable solutions and their implementation. Learn more at www.unu.edu/climate.

UNU-ISP News

Climate Change

The Role of Higher Education in Adapting to Climate Change

Speakers on the first day of the conference (from left, first row): S. B. S. Abayakoon, Konrad Osterwalder, Isao Kiso, (second row) Janette Lindesay, Diqiang Li, Nobuo Mimura, Toshio Koike, (third row) Kazuhiko Takeuchi, Kazushige Taniguchi, Hiroyuki

UNITED NATIONS UNIVERSITY

United Nations University Institute for Sustainability and Peace
5-53-70 Jingumae,
Shibuya-ku, Tokyo 150-8925
Japan

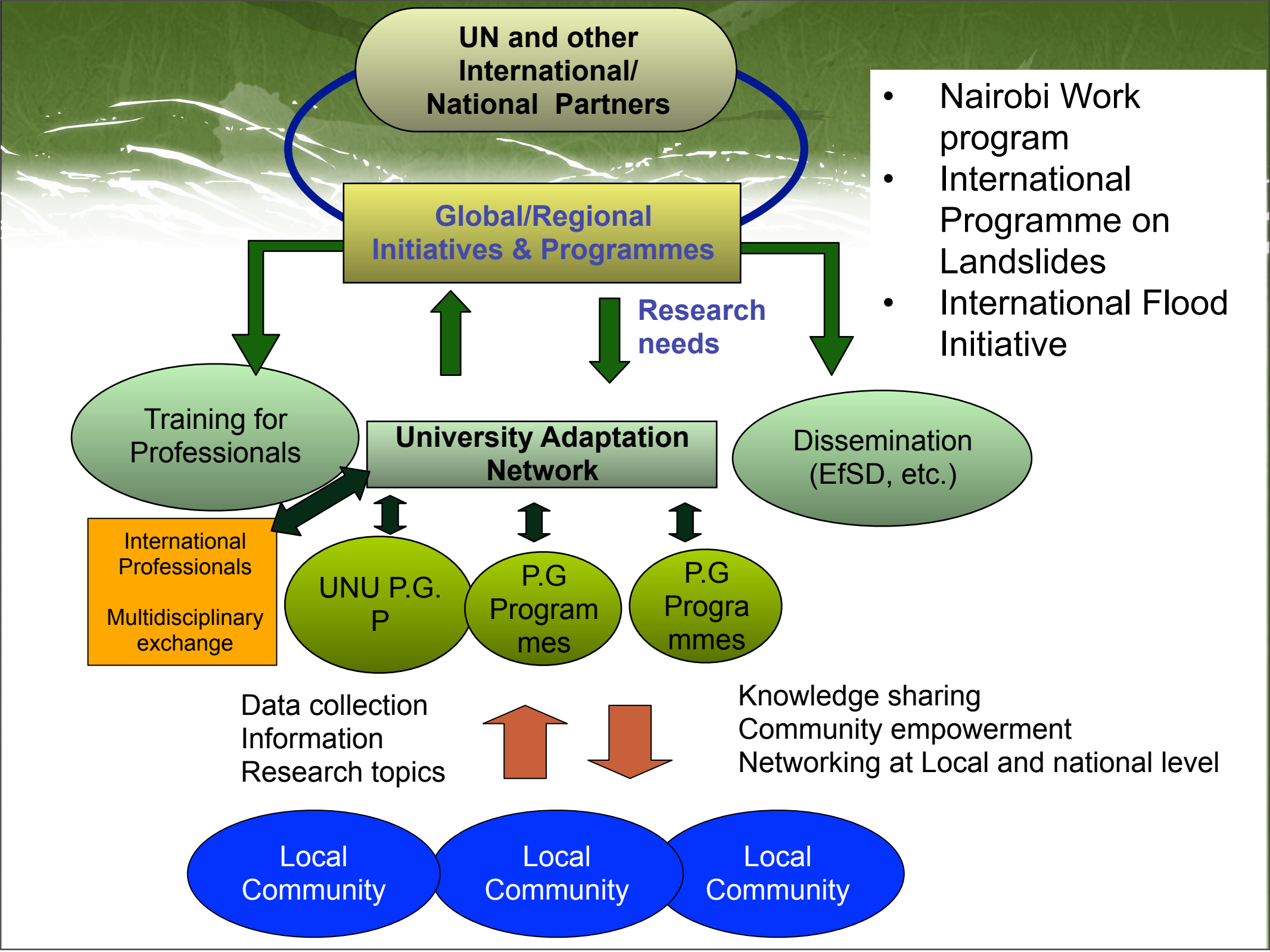
UNU-ISP, which became operational on 1 January 2009, was established to exploit the strengths of the former UNU Environment and Sustainable Development and UNU Peace and Governance Programmes, and to create transdisciplinary sy[illegible] http://unufms.net eff[illegible] global problems of human survival, development and welfare.

Now Open

Master's Degree Programme on Integrated Drylands Management

Applications for the 2009-2010 M.Sc. Programme are open. Application deadline is 31 July 2009.

http://isp.unu.edu/



- Nairobi Work program
- International Programme on Landslides
- International Flood Initiative

Towards a low carbon society

- Theres is an urgent need is to create new livelihood opportunities and provide an enabling environment in which the communities mostly affected by climate change can define their own programs based on local needs.
- Ability to understand climate change impacts locally is very important to design appropriate adaptation strategies.
- Enhancing capacity of higher education sector in the developing countries offer best hope to successfully address the capacity development needs.

Towards a low carbon society

- Ensuring availability of knowledge, experiences and expertise globally for adaptation under UN framework is very much desired.
- A global institution for adaptation and mitigation support may be established in partnership with UN to provide necessary technology and support for adaptation and mitigation planing for developing countries. Such transfer can be implemented through national level institutions for climate change similar to current disaster management centers (DMCs).