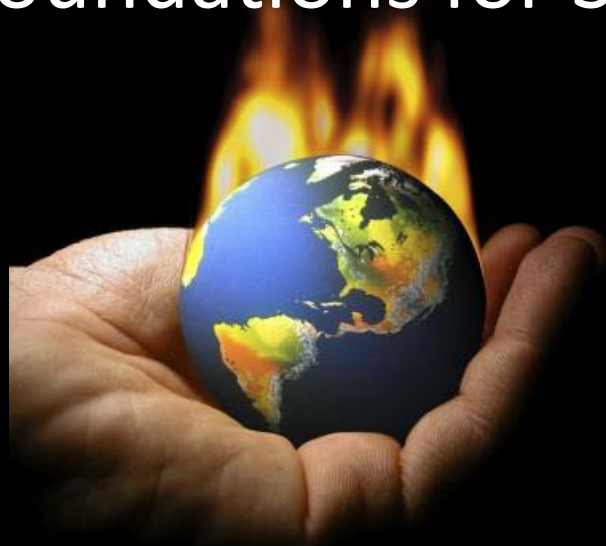


Transformative Change, Leadership and Capacity Building

Essential Foundations for Sustainability



**International Conference on Science and Technology for Sustainability
2011 - Building up Regional to Global Sustainability: Asia version**

Hassan Virji

Executive Director, START

Kyoto, 16 September 2011

www.start.org





Acknowledgements (incomplete!)

- Robert Kates/Harvard U.
- Leonard Berry/FAU
- Karen O'Brien/U. Oslo
- Graeme Pearman/Monash U.
- Many friends and colleagues in the START Family
- ...

Inspiration for this presentation

- Challenge to science/scientists to support sustainability efforts
- Challenge of capacity building as an essential imperative to meet sustainability goals
- Faith in young people who are the custodians of the future

Take home messages

- Urgent **need for transformative change and leadership**
- **Capacity building** for sustainable development is an essential imperative

Major Impacts and Consequences

:

+ High variability at seasonal, interannual and decadal scales



“The Lungs of the Earth” destroyed by human activities



Loss of biodiversity accelerated



Water resources disappearing from the Earth



Well-fed countries and starving countries



Fossil fuels heading towards depletion



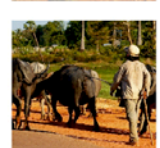
Rapid increase in energy consumption



Record-breaking droughts hitting grain-growing regions



Rapid increase in “climate refugees” in developing countries



The Game has Shifted!

We must address issues with decision lifetimes spanning seasons to centuries

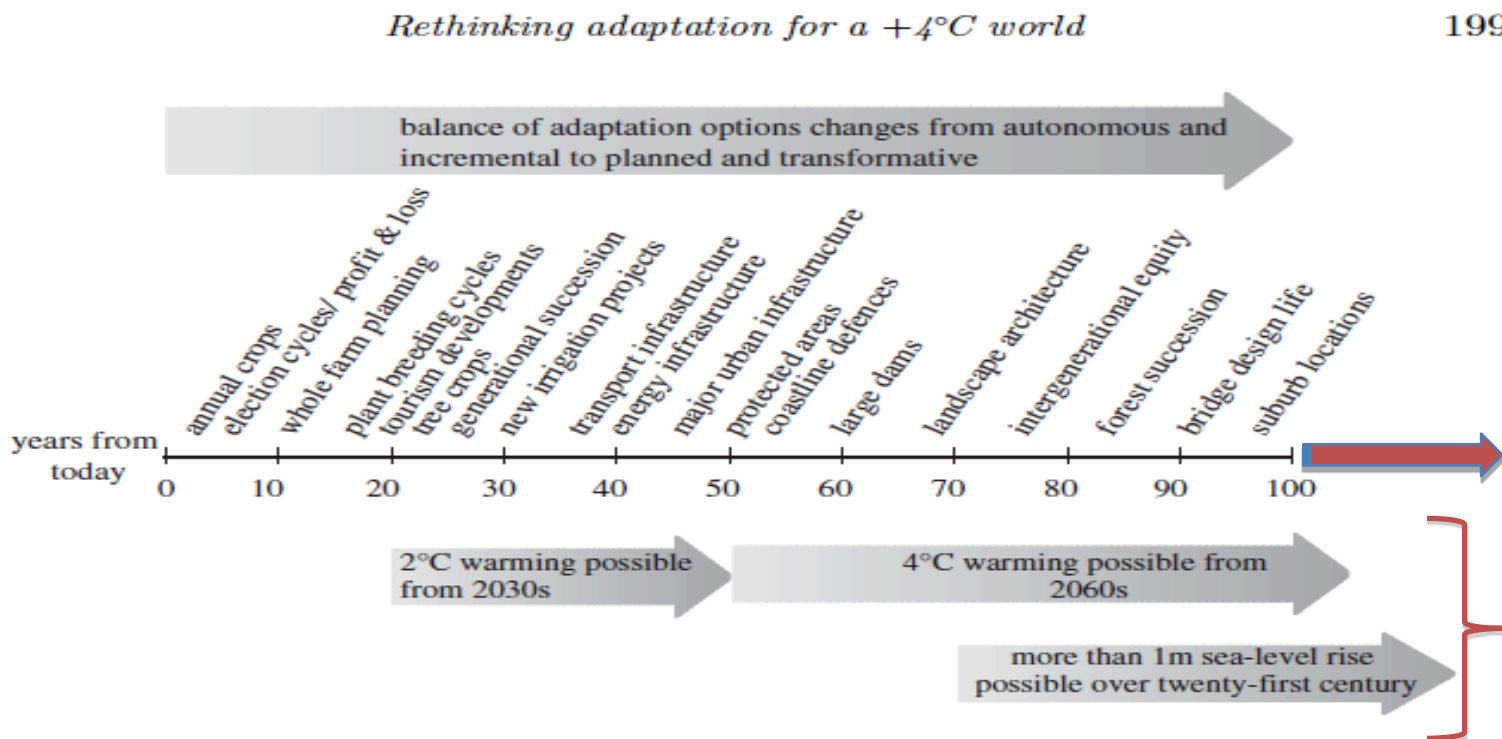


Figure 1. Timeline illustrating the lifetimes (sum of lead time and consequence time) of different types of decisions, compared with the time scales for some global environmental changes, and the changing implications for adaptation. Adapted from Jones & McInnes ([13], fig. 1.4), including items from Hallegatte ([8], table 1). Indicative global temperature rise since pre-industrial times from Betts *et al.* [1]. Indicative sea-level rise over the twenty-first century from Nicholls *et al.* [5].

Sustainability Science

- The ideas of sustainability science are two centuries old
 - Focus on Unity of Nature
- The practice is but a decade “young”!
 - Fundamental research on use-directed problems
 - Nurture of the next generations of sustainability scientists
 - Moving knowledge into action

Ideas of Sustainability Science 1799-1999

- Humboldt *Kosmos* (1799-1859)
- Marsh *Man and Nature* (1865)
- Vernadsky “biosphere and noosphere” (1940s)
- Bariloche *World Systems Model* (1970s)
- IUCN *World Conservation Strategy* (1980)
- Schellnhuber & Wenzel *Earth System Analysis : Integrating Science for Sustainability* (1998)
- National Academy of Sciences *Our Common Journey: A Transition Toward Sustainability* (1999)

Alexander von Humboldt's Dream

In a few hours we sail round Cape Finisterre. I shall collect plants and fossils and make astronomic observations. But that's not the main purpose of my expedition—I shall try to find out how the forces of nature interact upon one another and how the geographic environment influences plant and animal life, In other words, I must find out about the unity of nature.

Broad agreement that sustainability science should be: essentially integrative, bridging...

- the natural, social, and engineering sciences;
- the communities engaged in promoting environmental conservation, human health, and economic development;
- multiple sectors of human activity;
- geographic and temporal scales;
- the worlds of knowledge and action.



Sustainability Science Research needs to:

- **Overcome the emphasis towards environmental science**
- **Increase studies to reflect developing country priorities and human well-being**
- **Move down scale to regional and place-based science**
- **Use what we already know to move knowledge into action**

Sustainability science is regional and place-based

Focused at intermediate scales, where...

- multiple stresses intersect to degrade human-environment systems;**
- complexity is comprehensible,**
- integration is possible,**
- innovation and solutions take place**
- significant transitions toward sustainability have already begun.**

Readings in Sustainability Science and Technology

- Electronic Reader
- Advanced undergraduates, graduate students
- Choose from 93 readings
- Extensive introductions
- Readily available in developing countries
- Easily updated
- **Available at:**
<http://rwkates.org/pdfs/a2010.02.pdf>

Sustainable development

- Concepts/History
- Promoting human well-being
- Protecting life-support systems
- Human environment interactions

Sustainability science and technology

- Emerging Science
- Values and attitudes
- Analysis: causes, consequences, processes
- Integrative methods and models

Knowledge into action

- Moving knowledge into action
- Solutions: global and local
- Grand challenges

Challenge/Premise

1. Issues of global changes and sustainability, including climate change, and sustainability necessitate:
 - significant transformations in the systems and structures,
 - require individuals and groups to examine their beliefs, values and worldviews, including assumptions about growth, prosperity and a meaningful life.
2. Responses to the interacting processes associated with global change require transformations to occur across multiple dimensions and scales, and in different contexts and settings.

What is needed?

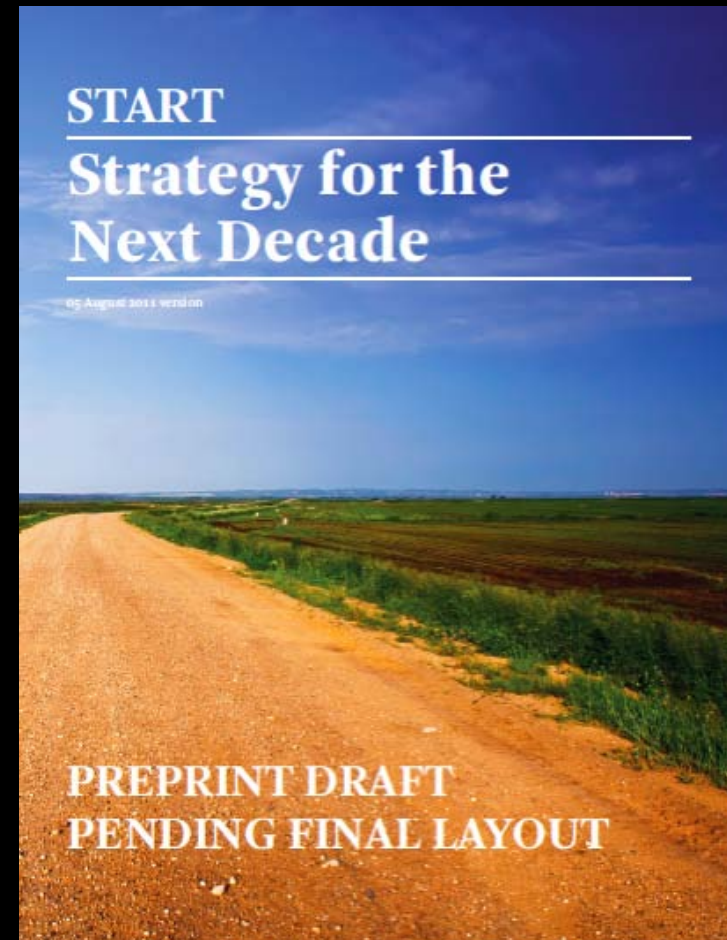
Need integrative, bridging approach
With focus on regional and place-based
issues of fundamental and applied
science where... “Transformative
Change” is possible

Necessary ingredients

- Focus on regional, place-based, **fundamental research on use-directed problems**
- **Nurture the next generations of scientists**
- **Move knowledge into action**
- **Foster leadership to inspire action**



ABOUT START

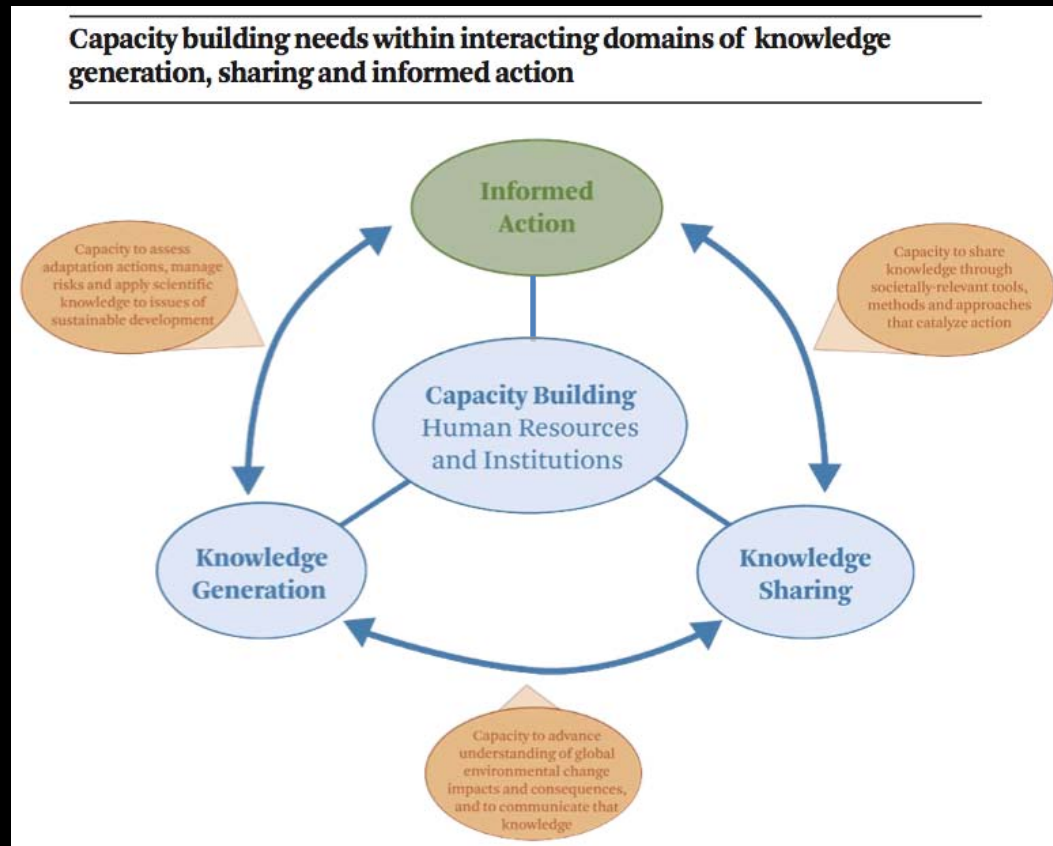


START VISION AND MISSION

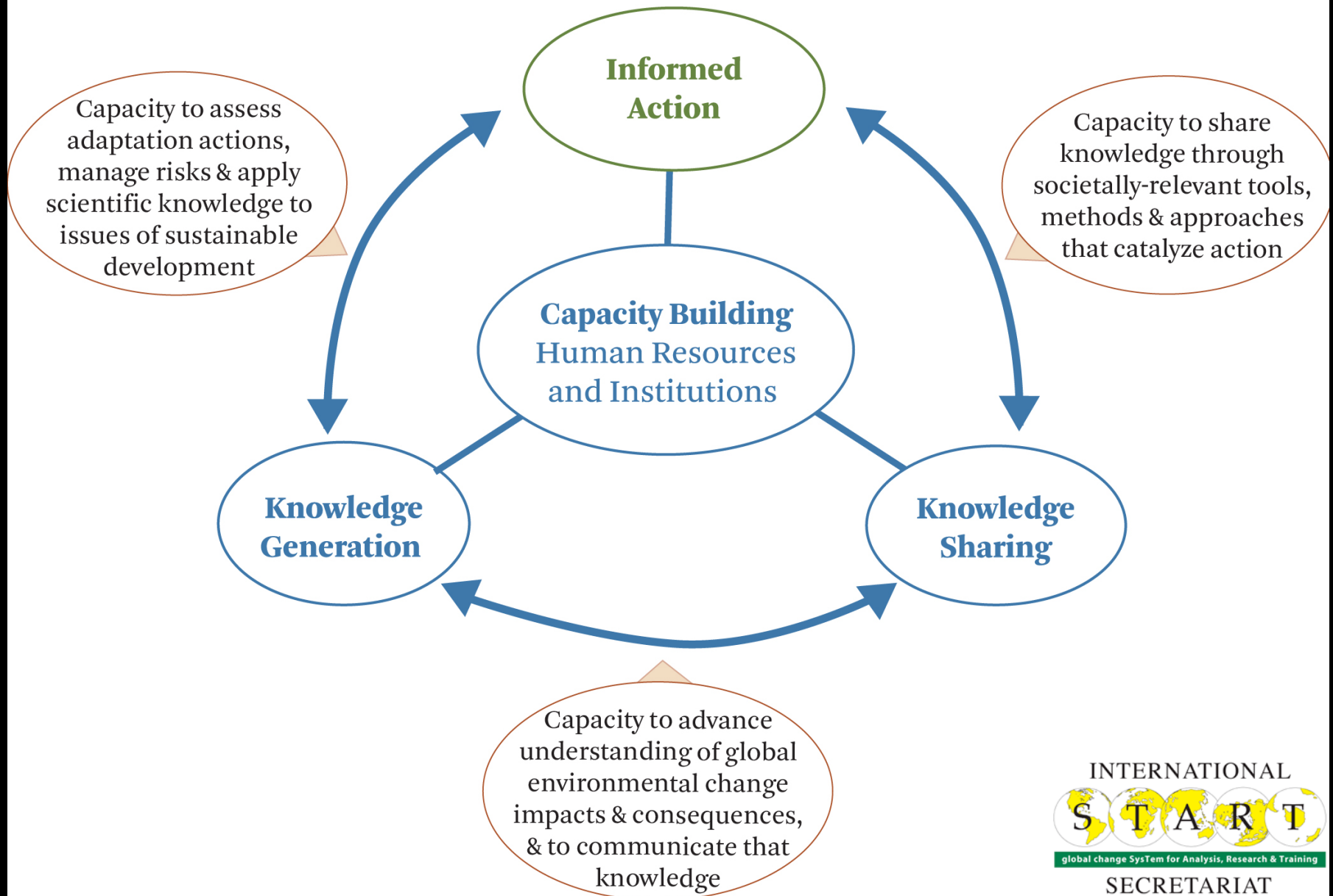
START VISION: Developing countries empowered with scientific capabilities to effectively motivate and inform societal action to manage risks and address opportunities of global environmental change and sustainable development

START MISSION:

- To **develop regional networks** of collaborating scientists and institutions that assess the causes and impacts of global environmental change and provide relevant information to policymakers and governments to assist in formulating adaptation strategies;
- To **enhance scientific capacity** in developing countries by strengthening and connecting existing institutions, training global change scientists, and providing them with better access to data, research, and communication technology skills; and
- To **mobilize resources** that will augment existing capabilities and actions on global environmental change in developing countries.



Capacity building needs within interacting domains of knowledge generation, sharing and informed action



START Programs And Activities 2010-2011

In recent years, START's projects and programs supported knowledge generation and dissemination to inform policy and decision-making in and across climate-sensitive sectors in Africa and Asia-Pacific. START's efforts have focused on these broad areas to promote collaborative effort between natural and social scientists:



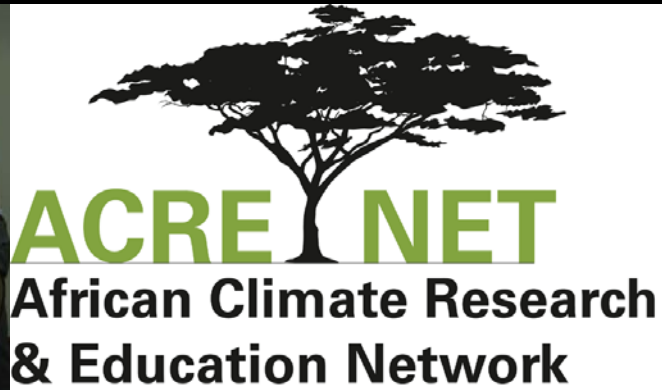
Agriculture and Food Security

- START Grants for Global Change Research in Africa and grants in collaboration with APN for Asia-Pacific region
- Assessments of Urban and Peri-urban Agriculture and Climate Change (collaboration with UNEP and EU and regional nodes)
- Engagement with the Climate Change, Agriculture and Food Security (CCAFS) Initiative



Innovations in Education

- Forum on Education, Capacity Building, and Climate Change: A Strategy for Collective Action in Africa...(and Asia?)
- African Climate Research & Education Network (ACRE-NET)
- Climate Change Fellowship Program (Africa; Asia and Americas under development)



Land Use, Ecosystems and Biodiversity

- Global Observation of Forest Cover and Land Dynamics (GOFC-GOLD)- contributes to GEO and REDD+ >> Regional networks
- Biodiversity Conservation Under a Changing Climate with focus on conservation, ecosystems and livelihoods: regional networks, collaboration with IUCN, WWF, CARE, etc.



Communication

- National Level Science-Policy Dialogues on Climate Change and Development – a collaboration with the IPCC and WMO
 - Bangladesh, Bhutan, Nepal, Ghana, Tanzania, Nigeria, Senegal, Rwanda and Burundi



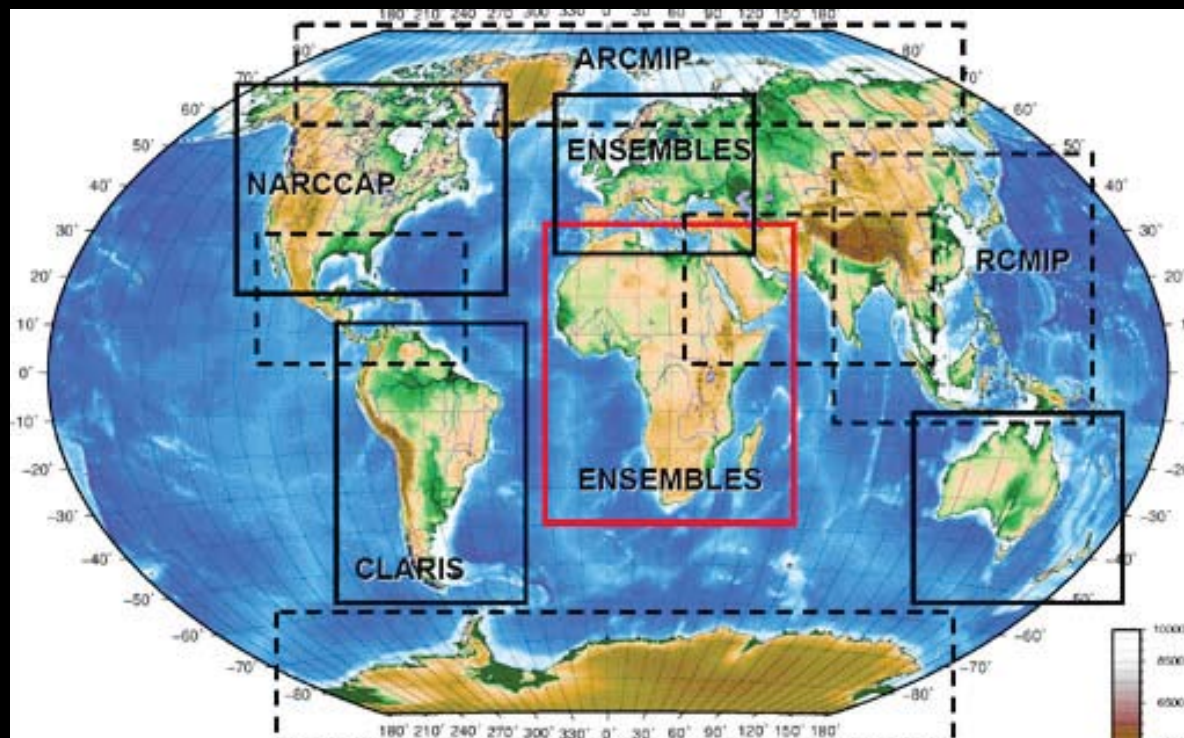
Climate Change and Cities

- Cities at Risk (CAR): Building Adaptive Capacities for Managing Climate Change Risks in Asia's Coastal Megacities
- Urban Poverty and Climate Change
- IRDR ICE; DRR and Humanitarian Assistance Organizations



Climate Services

Engaging the user communities in the WCRP's Coordinated Regional Downscaling Experiment (CORDEX)





Some Asia-specific Examples:

- **Water**
- **Carbon Cycle**
- Urban sustainability
- Community based adaptation

SARCS Funded Research Projects (2002-2008)

Year	Title	Research Team
2002-2003	SEA Regional Sustainable Development Indicators Study	5
2003-2004	South China Sea Regional Carbon Pilot Project	5
2004-2005	Biogenic Anthropogenic Emissions from Southeast Asia	6
2005-2006	Southeast Asia Regional Carbon and Water Project	6
2006-2007	Southeast Asia Regional Carbon and Water Project (Phase II)	7
2007-2008	Southeast Asia Regional Carbon and Water Project (Phase III)	6

GCP (2003) P.36



ESSP Report No.1

GCP Report No.1

The Global Carbon Project



A framework for
Internationally Co-ordinated
Research on the
Global Carbon Cycle



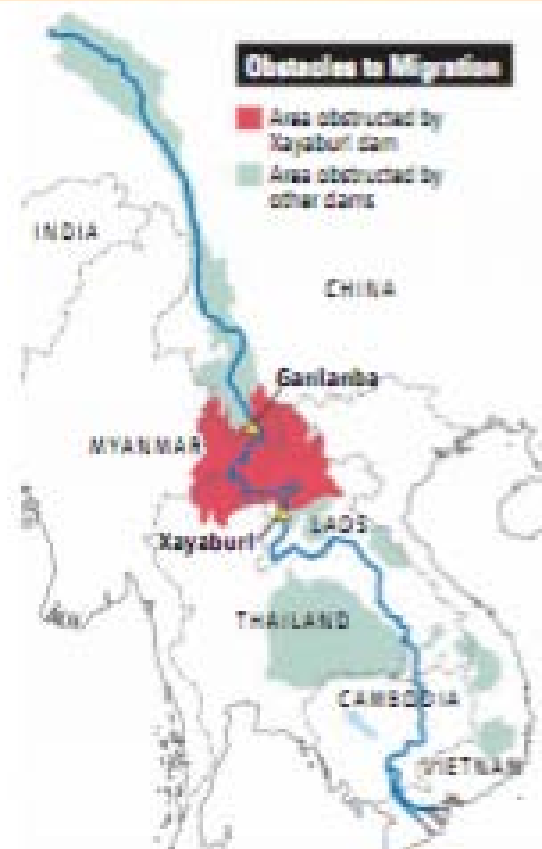
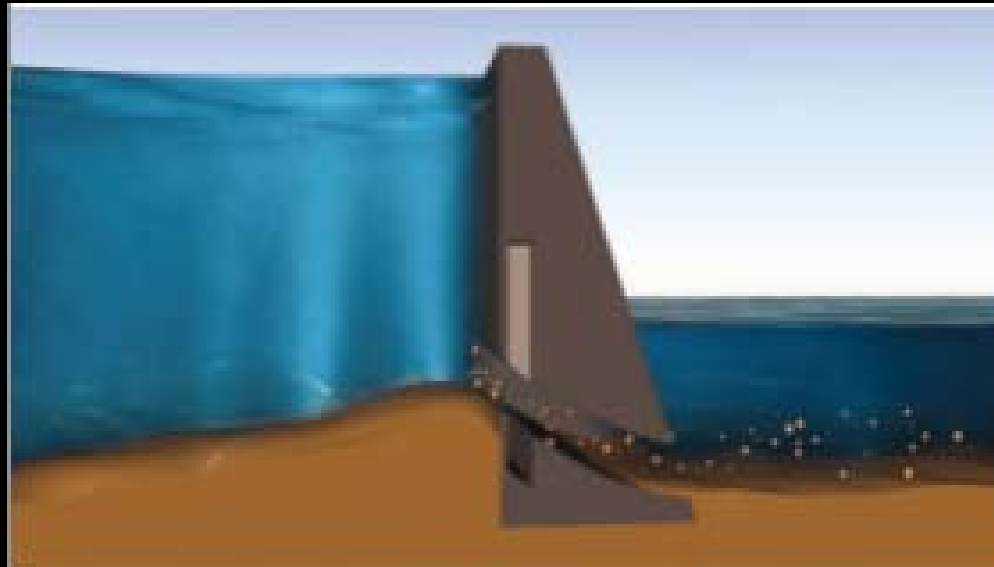
www.globalcarbonproject.org

Links to other projects and activities:

This activity will require working in partnership with multiple national and regional programmes, and international projects already coordinating individual components of the carbon cycle. On carbon research, the GCP will work with IMBER, SOLAS, and CLIVAR. The IOC/SCOR CO₂ Panel will be a full partner in ocean coordination throughout the IOCCP activity. For lateral transport, the GCP will work with the Land-Ocean Interactions in the Coastal Zone (LOICZ), the JGOFS-LOICZ joint Continental Margins Task Team (CMTT), and IMBER. On land issues, the GCP will work with GCTE (e.g., BASIN, Erosion Network), Land-Use/Cover Change (LUCC), the new IGBP/IHDP Land project, Fluxnet, Industrial Transformation (IT) and others. Research on CO₂ from space will be in partnership with Global Energy and Water Cycle Experiment (GEWEX). A critical interface is being established with IGCO with regarding coordination, standardisation, and new operational observation requirements, with specific partnerships with GTOS (and the Terrestrial Carbon Observation strategy) and GOOS programmes. Cosponsorship is being established with Global Change Systems for Analysis, Research and Training (START) to engage less-developed countries. Cosponsorship of the South China Sea Regional Carbon Project also with the Southeast Asia Regional Committee of START (SARCS) is in progress. Links to all national and regional carbon cycle research programmes will be established (e.g., Australia, CarboEurope, North American Carbon Programme (NACP), China, Japan, Large-Scale Biosphere Atmosphere Experiment in Amazonia (LBA)).

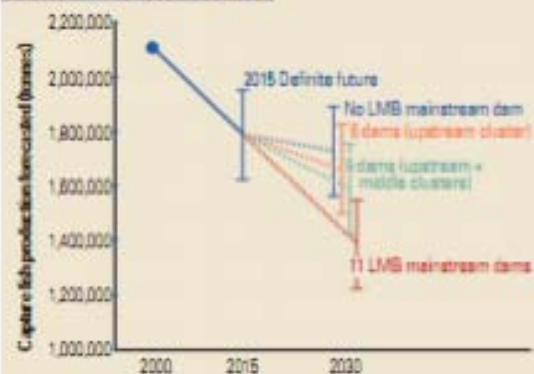


Untapped potential. The Mekong River dynamo could generate a whopping 53 megawatts of electricity.



Tourniquet. By one estimate, Xayaburi dam would obstruct about 125,000 km² (red), or 36% of habitats in upstream watersheds not already obstructed by other dams. Experts urge Xayaburi designers to incorporate sluice gates (top) that allow sediment to flow downstream.

A Challenge for Food Security



Diminishing returns. Dams are predicted to harm fisheries.



Look Ahead for START:

Three thrust areas

1. Knowledge generation-related

- Strengthen and expand multi-disciplinary and trans-sectoral expertise in integrated research and assessment that foster stronger and more engaged south-north and south-south research networks.***



Look Ahead for START:

Three thrust areas

#2: Knowledge sharing and informed action-related

Promote effective communication between communities of research, policy and practice that enhance the ability of countries and regions to generate demand-driven knowledge and to catalyze the translation of research into action.



Look Ahead for START: Three thrust areas

#3: Education-related

Support efforts by universities in Africa and Asia to inform and engage society in development trajectories that are resilient and adaptive to global change



Sustainability Science Core Questions & Major Themes

- Long-term trends & transitions
- Human environment systems adaptability, vulnerability
- Integrative human environment theory and models
- Tradeoffs between human wellbeing and nature
- Limits or boundaries for effective warning
- Societal guidance of human environment systems
- Evaluation of sustainability trajectories

All address issues of transformative change in our society and focus on “WEHABU” themes

Adapted from Kates 2011 and presentations at this meeting




Acting on what we already know—

- Increase trends in fertility reduction
- Reverse declining trends in agricultural production in Africa, sustain elsewhere
- Accelerate improvements in use of energy and materials
- Use opportunities for expanded urban systems to be habitable, efficient, and environmentally-friendly
- Restore degraded ecosystems, while conserving biodiversity elsewhere

i.e., bring about transformative change in our society!

>> requires transformative leadership!



Finally, on the need to foster
transformative leadership:

cChange proposal recently
submitted by
Karen O'Brien/U. Oslo on behalf of
an international group of
collaborators



cChange Proposal

Priority objectives:

- **Develop a theoretical, empirical and practical basis for understanding transformation;**
- **Increase the capacities and competencies of individuals, groups and institutions to activate transformation towards a sustainable and resilient future.**

Key Research Questions...and....

- *What **types** of transformation are necessary?*
- *What **factors** facilitate transformation in theory and in practice, across different systems, sectors, and domains?*
- *What types of **capacities** and competencies need to be developed to initiate transformations that are both ethical and sustainable?*
- *How does science itself need to change, and how can new approaches to global change research contribute to transformation of both theory and practice?*



....Research Domains:

- Economics of Transformation
- Politics of Transformation
- Urban Transformations
- Coastal Transformations
- Community-based Transformations
- Transformative Learning
- Transformative Leadership
- Transforming Practices
- Transforming Paradigms



“Research as Unusual”

- ***Commitment to self-transformative practices:*** include personal transformation as part of the transdisciplinary, action-research, including development of leadership capacities among CChange members.

Transformative Leaders:

- **Margaret Meade:** a transformative leader who fostered holistic vision of the human species



A small group of thoughtful citizens can change the world; indeed, it is the only thing that ever has.

Margaret Mead

Thank You!
Asante Sana!

