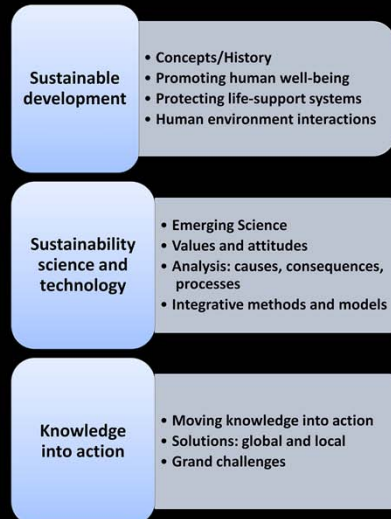


Readings in Sustainability Science and Technology

- **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>



As an aside, let us note that as educational opportunities continue to increase in sustainability science, there is need for new sets of educational materials. A major effort, over four years, are the *Readings in Sustainability Science and Technology* prepared by Bob Kates. For teachers of advanced undergraduate students and beginning graduate students, it suggests a three part architecture for sustainability science, the first focusing on sustainable development, its history, the dual needs for promoting human well-being and protecting the life support systems of the planet, and how these combine as human environment interactions. The second part addresses the approaches, methods, and models of sustainability science. The last part describes examples of knowledge that should be moved into action and features for each need a local and global example. In all, there are some 93 readings to choose from, as well as a mini-text of 60 pages that can be used as a primer. And as an electronic reader it can be frequently updated with your help.

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.



This then leads me to note two premises on which there is broad agreement (see slide).

Note that science for sustainability is most opportune at regional and smaller scales, and therefore consideration of the nexus of development and sustainability require that we must stress the need for fundamental research on use-inspired challenges and problems that need informed actions in the WEHABU sectors. In this context, there is a clear need for capacity building that is well recognized by ICSU and partners.

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



Today, I posit to you that a concerted effort on science for sustainability (i.e., bringing about transformative change in our society so that we become informed, educated citizens capable of making informed decisions and trade-offs) implicitly includes, and must foster and engage. transformative leaders – a particular challenge for capacity building that RIHN and other regional university centers might consider including in their portfolio.

Necessary ingredients

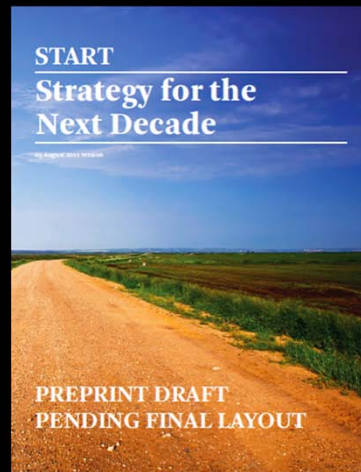
- Focus on regional, place-based, **fundamental research on use-directed problems**
- **Nurture the next generations of scientists**
- **Move knowledge into action**
- **Foster leadership to inspire action**



In view of these arguments, the necessary ingredients (or tasks) for sustainability science are as in this slide.

These form the motivation for me to briefly describe the work of my organization, START (global change System for Analysis, Research and Training) that is dedicated to capacity building in developing countries; in this context of capacity building I include both human resource development/enhancement and institutional strengthening...

ABOUT START



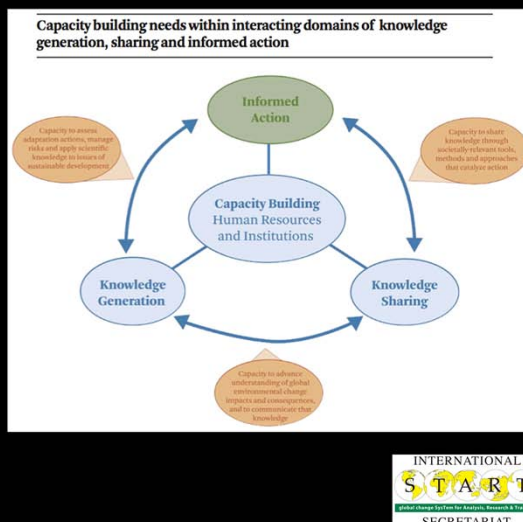
I have put a few paper copies of these two pre-print document on the desk outside and draw upon the material there to tell you a bit about START, an NGO that is a partner in the Earth System Science Partnership of our “founding strategic partners, IGBP, IHDP, WCRP, and DIVERSITAS. START’s vision and mission are...

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.



START MISSION:

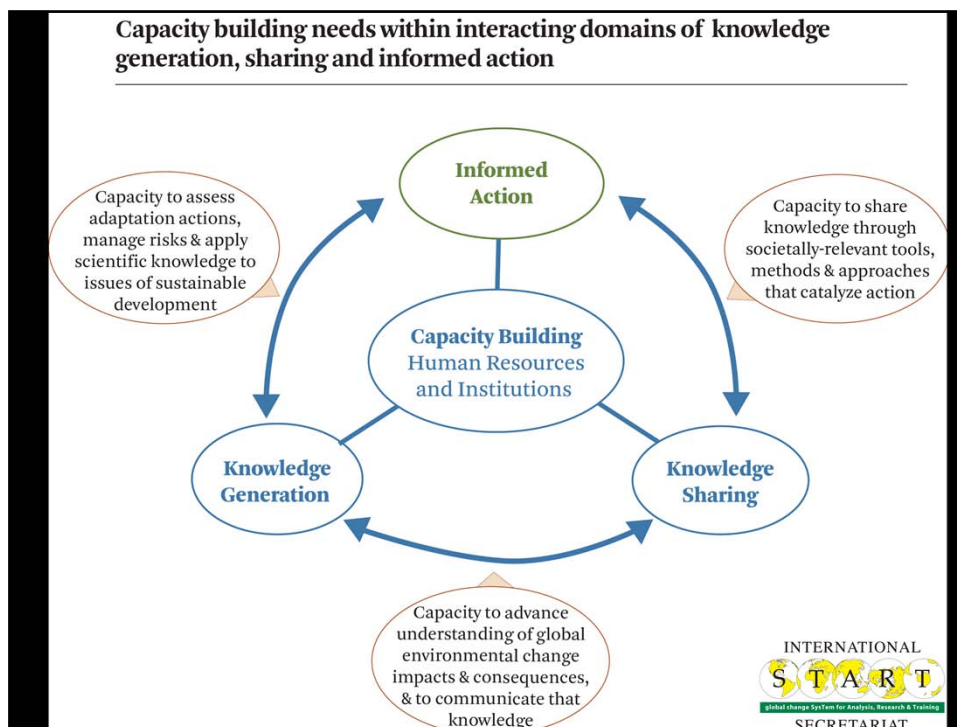
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To **enhance scientific capacity** in developing countries by strengthening and connecting existing institutions, training global change scientists, and providing them with better access to data, research, and communication technology skills; and

To **mobilize resources** that will augment existing capabilities and actions on global environmental change in developing countries.

In the figure:

Note the interacting domains of knowledge generation, sharing and informed action. In order to meet the challenge of GEC and sustainability, capacity must be built among all these domains. While during its first decade START emphasized primarily the capacity building for knowledge generation, now START actively emphasizes and engages in all three domains.



This figure depicts the START framework for research-driven CB across the knowledge-to-action chain and notes the broad categories of capacity building actions that START engages in. Our comprehensive portfolio of capacity building modalities includes grants, fellowships, advanced institutes, young scientists conferences and events, etc. Amongst the participants at this symposium is a young scientist who went through such an experience; you might want to seek his opinion on experience in one of our activities. It is worth noting that we work in collaboration with many strategic partners, including the GEC programmes, the UN system, and many other academic and non-governmental organizations, such as TWAS, IFS, APN, etc.

START works closely with academic as well as governmental and civil society sectors in developing countries, especially Asia and Africa. We have been in existence for 20 years. Our work targets young and early career scientists. Our activities at regional and national scales typically focus on scientific activities and programs that resonate in the developing countries and attempt to help meet their development trajectories.

In essence, START's effort could be boiled down to human resource development and institutional strengthening. In a typical year we actively engage at least 1000 young and early career scientists from the developing world and numerous others worldwide in collaborative research.

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 &
Food Security

Innovations
in Education

Biodiversity
& Ecosystems

Communication

Climate Change
& Cities

Climate
Services



START was founded in 1992 around the time of the UNCED event. Our work is both centrally coordinated through the International START Secretariat based in Washington DC, and through START Regional Centers located in Asia-Oceania and Africa. Here I give you a flavor for some of recent work along the thematic areas related to sustainability.

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



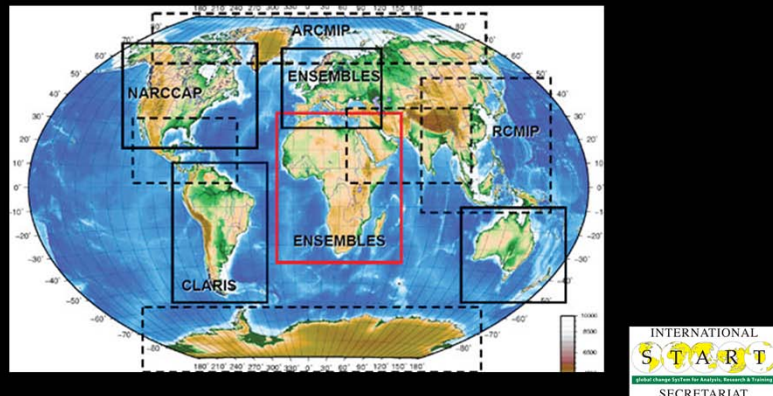
Climate Change and Cities

- 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

┆Very briefly, let me touch on a few specific examples of our activities in Asia and related concerns...

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

An example of START's capacity building actions related to regional research networks development in Southeast Asia.

More than 250 young regional scientists have the opportunity to interact with international known scientists and some of them continue to mature and become productive members of international scientific enterprise, publish in reviewed international journals. Such sustained action is needed over long-term in order to prepare the future scientific workforce in the developing world.