Climate Change and Water

Program Prospectus for 2010-2015

Note: This is a simplified version of the Climate Change and Water prospectus that has been adapted from the document submitted to, and approved by, the IDRC Board of Governors in March, 2010

Program and Partnership Branch
International Development Research Centre

Table of Contents

1. Executive Summary

Climate change is having a profound effect on water worldwide. A combination of changes in rainfall patterns and amounts and rising temperatures, is causing increased evaporation, glacial melt, landslides, flooding and drought. This environmental change is affecting the frequency and severity of water related natural disasters as well as the availability and quality of water. The focus of this five-year Climate Change and Water Program is to support applied, policy-relevant research to help the world's more vulnerable people adapt to the water-related impacts of climate change.

The program will support applied research, capacity building, and improvements in how research results are shared with and taken up by those who can benefit from them. In keeping with IDRC's mandate, developing country research institutes will be the primary constituency. By providing grants and technical guidance, the program will encourage the development of specific research tools to cope with the water related impacts of climate change and build the research capacity needed to estimate and respond to risks created by climate change. The program will explore certain emerging areas, such as the links between climate change, energy, and water, to identify useful avenues of investment. Research will also be carried out on how information and communication technologies can support climate change adaptation. Ultimately, this program is designed to ensure that the developing country voice of research and science is heard in public policy debates.

By the end of this program, we expect that our portfolio of research projects will have contributed to improvements in the adaptive capacity of the communities where the research has taken place. We also expect that our recipients will be better able to support effective plans and policies that enhance the adaptive capacity of the communities they serve. Finally, we expect that the researchers we support will be better equipped to work closely with policy makers as a matter of practice and be well positioned to influence policy debates.

2. Context and Background

a. Development Challenge and Situational Analysis

Climate change is having a profound effect on water worldwide. A combination of changes in rainfall patterns and amounts and rising temperatures, is causing increased evaporation, glacial melt, landslides, flooding and drought. This environmental change is affecting the frequency and severity of water related natural disasters as well as the availability and quality of water resources.

The catalogue of observed impacts of climate change on water is already long and includes: more severe droughts reducing crop yields affecting food security (Africa); rising frequency and intensity of storms resulting in more severe flooding and reducing the availability of clean water, particularly in cities (Caribbean, Southeast Asia); and increasing rates of glacial melt leading to increased tension over the allocation of remaining water supplies, at both local and international levels (South America, South Asia).

The poor and marginalized members of society, including woman, children, the elderly and minority ethnic groups, are disproportionately vulnerable to these impacts. This vulnerability is affected by their often limited access to: financial and insurance resources; information pertaining to adaptation measures; and social protection measures. These factors are further compounded by the often poor preexisting access to an adequate clean water supply. Successfully managing water in the face of climate change will require the ability to enact strategies that reduce this vulnerability.

Defining Climate Change Adaptation

The language of "adaptation" is being debated and discussed and there continue to be differences of opinion about its definition. A commonly understood definition comes from the IPCC which sees adaptation as the "*Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities*." More nuance is offered in discussions around *planned adaptation* (where forethought into an adaption effort is made) and *autonomous adaptation* (people coping with climate change impacts on a day to day basis). Adaptive capacity, meanwhile, can be simply defined as the ability of a system to adjust to climate change. Building adaptive capacity therefore implies that we are improving the ability of people to modify practices to cope and manage climate change. This program is largely about research that can support the building of adaptive capacity.

Developing countries have long been faced with serious problems associated with water stress however efforts to improve water management have had limited success. Water demand from domestic, agricultural and industrial uses is outpacing supplies while limited treatment and sanitation cause considerable downstream problems for human and environmental health. A gap in the capacity of research institutions to develop the necessary knowledge to inform decisions makers as well as weak communication links between researchers and research users are two key reasons for this. Given the inherent uncertainty related to climate change, finding ways to increase and manage the availability and access to clean water is becoming increasingly urgent.

Tying the above together presents some compelling questions including:

- How can what we know about vulnerability to climate change be used to improve policymaking?
- How can we realistically and pragmatically reduce the impact of water stress (e.g., flooding, lack of clean water, etc.) on marginalized communities?
- How can existing and planned water supply infrastructure be strengthened in the face of climate variability?
- What enhancements to information systems would help build adaptive capacity?
- What are the economic impacts of climate change and costs associated with adaptation?
- How can evidence based understandings better influence policy decisions?

b. About the Program

The Climate Change and Water (CCW) program is focused on supporting applied research and capacity building in developing countries. Through this it seeks to develop and implement adaptive frameworks to appropriately manage the water related impacts of climate change. Cost-effectiveness, equitable distribution of benefits and legitimacy are all factors that play into defining the success of an adaptation strategy. They will thus be key criteria in the work CCW supports.

Using water as an entry point allows IDRC to exemplify its comparative advantage and bridge a well established scientific community in natural resource management with the emerging debates on climate change. Previous work within a range of IDRC program areas has highlighted three thematic areas in which CCW can make a significant contribution to improving developing countries' capacity to effectively adapt to the water related impacts of climate change. These include:

1. Improving the quality and availability of water in areas highly vulnerable to water stress

CCW will support research on tools that cope with water stress while stimulating livelihoods. The focus will be on low-cost, low-technology approaches that are feasible in the context of poverty. Some potential research topics in this area include: safe and cost-effective re-use of degraded water; waste water treatment; use of water in sustainable energy production; and water demand management measures.

CCW will also support research aimed at developing the understanding of the local social, economic, and political dynamics needed to ensure these tools are successfully adopted. Some potential research topics in this area include: economic costs of adaptation measures; social equity of allocation measures; and water governance.

2. Managing risks and unexpected impacts from climate change events as they relate to water

CCW will support research into the development and implementation of appropriate metrics of adaptive capacity. Given the local variability of the water related impacts of climate change, efforts will be focused on building this research capacity at a local level. Some potential research topics in this area include: the use of Information Communication Technologies for Development (ICT4D) as risk measurement and disaster response mechanisms; the economic costs associated with a failure to adapt; and the development of regionally significant indicators on climate change risk management.

3. Improving and informing debates, policies and decision making around local adaptation strategies

From a policy influence standpoint, the most successful projects in IDRC's past have occurred where researchers have enjoyed high-level support through effective communication; credible and timely interventions; and/or interpersonal connections. For this reason CCW will also provide support for the improvement of communication between researchers and decision makers. Our entry point will focus on evidence-based options that are validated by policy makers themselves and tested by research. Because good policy requires an understanding of the trade-offs between action and inaction, a focus will also be placed on the robust analyses of the economics of adaptation.

3. Approach to Programming

a. Program Goal

CCW's goal is to support applied, policy relevant research that helps vulnerable people adapt to the water related impacts of climate change. In order to track and monitor progress towards the achievement of this goal, the following indicators have been developed:

- Verifiable increases in the capacity of recipients to produce policy relevant and/or practical contributions;
- Production of high quality and credible research results (i.e., peer reviewed);
- Evidence of methodological improvements in climate change and vulnerability research; and
- Evidence of improved communication and dialogue between researchers and research users.

Given the uncertainties around climate change, these indicators will remain flexible in order to allow CCW the ability to modify aspects of its programming to respond to issues as they emerge.

b. Program Outcomes

Despite well established expertise in the field of water management, the novelty of its application under climate change remains apparent. As a result CCW proposes a series

of graduated outcomes ranging from minimum expected outcomes, through to more ambitious high expected outcomes (see Table 1).

Table 1. Summary of projected program outcomes

Baseline	Minimum outcomes	Medium	High
Research on climate change and water is disparate and largely driven by institutions in developed countries. Some good work in developing countries is starting to emerge particularly in Asia. Much research does not positively impact communities.	A group of research projects supported by CCW are able to improve the quality and availability of water for the poor, reduce risk and/or affect change in policy in the face of climate change. Strategies to build adaptive capacity to such change are tested and understood. Bottlenecks to the uptake of existing technical and managerial options are identified.	Partners are able to secure other sources of funding for their research. Research projects are growing in prominence and more people are positively affected by the applied work. A measurable change in adaptive capacity is noted in several communities or institutions.	Improvements in adaptive capacity to climate change and a reduction in vulnerability to water stress at multiple scales, from small communities to larger sub-regions affecting a large population, are documented.
The capacity of many researchers in the field of climate change and water to conduct vulnerability, social, gender, and economic analysis, is weak. The potential for multi-disciplinarity to contribute to climate change adaptation has not been realized.	The capacities of a number of researchers (minimum 15) to use key/pivotal methods to conduct economic analysis and apply appropriate social research methods to improve water management linked to climate change and their ability to communicate research results are strengthened.	These methodological approaches are being readily applied in research and helping to reduce barriers to scaling up solutions to water stress.	Multidisciplinary approaches and methodological innovations in social analysis, water management and economic analysis are being used by, and influencing other research organizations and in some instances, policy makers.
Policies and laws for water management tend to be supply focused and as of yet do not consider the likely impacts of climate change. Policies are not flexible and are very difficult to modify based on the changing environmental scenario.	Research leads to validated policy options that are communicated to potential users. Feasible strategies to improve water security in changing climate conditions are made available. Researchers are working closely with policy makers as a matter of practice.	Several cases of national or municipal policy change are affected and/or informed by the program's research.	Improvements in access to water are evident as a result of policies put in place with support from CCW. Policies reflect the need to be adaptive/flexible in the face of climate change.

c. Program Strategy and Approach

The following are the three strategic focuses through which these goals will be sought:

1. Research

CCW will support research through the development of project grants (CA$400,000 – CA$1 million) along the lines of the IDRC "Grants Plus" model. Program Officers will provide technical guidance and facilitate access to opportunities based on demand and requirements of research teams. Funding will be set aside to profile the results of our partners through traditional published media – including books, book chapters, and peer reviewed journal articles – as well as through multimedia production – including video,

audio, and electronic policy and data briefs. Common elements for many supported projects will include:

- Multi-disciplinary teams;
- The use of gender and other appropriate social research methods;
- The application of economic research methods;
- Explicit local relevance; and
- High potential for local impact.

CCW will support both established high capacity institutions and emerging institutions requiring greater technical guidance and oversight. In its support of projects, CCW will seek to balance a portfolio of institutions ranging from both ends of this spectrum. Our priority will be to support institutions located and working in developing countries.

2. Capacity Building

While research provides the fertile ground to build knowledge, local level participation in the development and dissemination of this knowledge ensures that communities have the experience to successfully translate research findings into effective adaptation measures. The priorities for capacity building in this program will include:

- Strengthening knowledge of climate related risk management and vulnerability reduction;
- Building skills in policy relevant gender, social, and economic analysis;
- Improving water management to cope with climate uncertainty; and
- Communicating research results, with a focus on publishing peer reviewed research.

To encourage novel graduate research in the field, CCW will develop a Graduate Researcher Awards Program. This program will connect graduate researchers with existing projects in our portfolio in order to address gaps in the research and encourage their professional development in applied research.

Small grants will be used to expose researchers to the application of new and appropriate methods.

3. Policy Influence

Policy change is dynamic, complicated and requires a cautious approach that engages policy makers in the research process. To do this well requires research teams that are attuned to the needs of research users, and who can communicate effectively with different policy audiences. CCW will seek to build capacity in this regard trough the support for such initiatives as:

- Training courses on policy engagement;
- Training courses on writing for peer-reviewed publication; and
- Networking events such as conferences and workshops.

Figure 1 presents an overview of the planned five-year implementation of the CCW program.

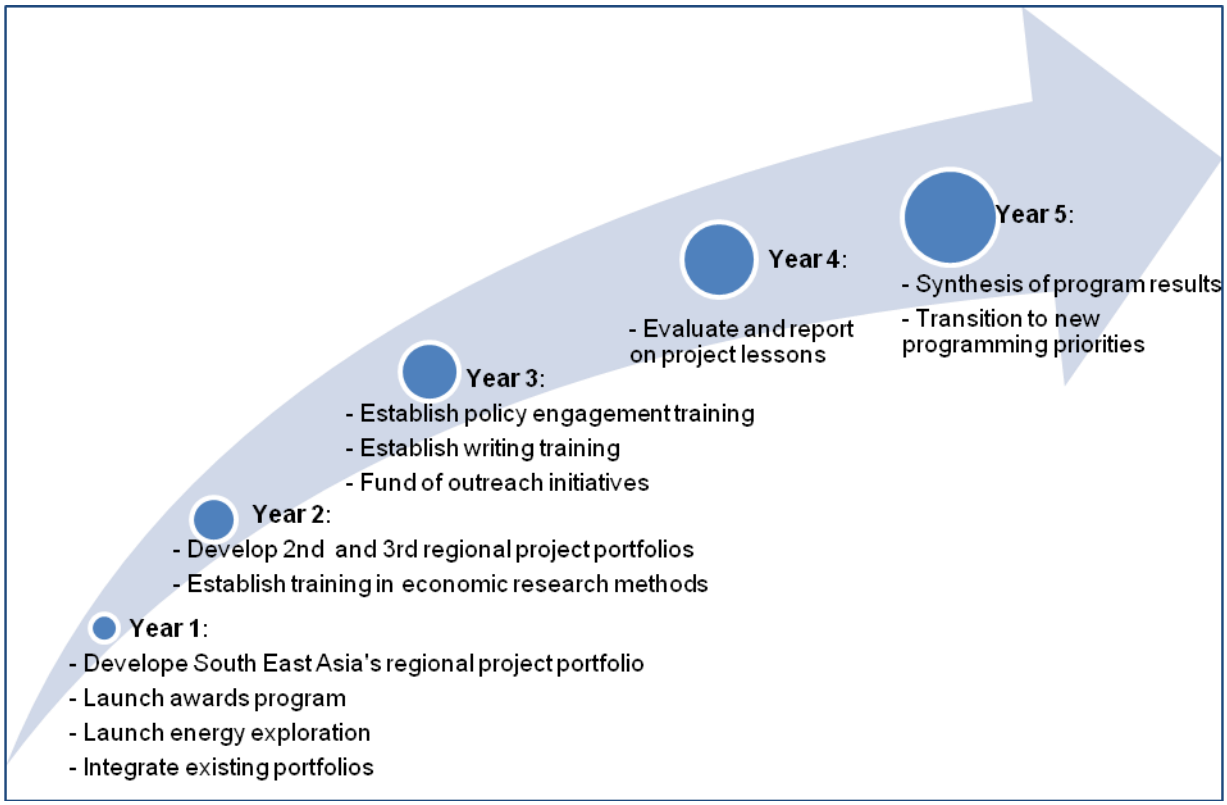

Figure 1. A timeline of the Climate Change and Water program 2010-2015

d. Regional and Thematic Priorities

There is a great deal of regional variation in terms of how climate change is impacting water stress. As a result there are a wide range of research entry points that could be pursued. Table 3 outlines some of the initial regional priority areas around which CCW programming will be developed.

Table 3. Regional Thematic Priorities

	Thematic Priorities
Sub-Saharan Africa	• Effects of flooding on sanitation, drainage and access to potable water in cities • Effects of recurrent droughts and effects on food security in rural areas • Managing competition and conflict over increasingly scarce water resources • Reduction of extreme poverty through the improvement of water management and adaptive capacity

	Thematic Priorities
Southeast Asia	• Economic impacts of decreasing agricultural yields and increasing dependence on irrigation • Impacts on human security of short-term sea-level rise (storm surges, flooding) in densely populated coastal cities. • Effects of saline intrusion on livelihoods in low-lying coastal plains and deltas • Cost-benefit analysis of investment and development planning decisions
South Asia	• Consequences for downstream cities and food production from changing flows of glacial fed rivers • Resilient infrastructure to deal with unanticipated challenges generated by rapid urbanization and industrialization in mega-cities • Impacts of increased storm intensity and gradual sea level rise on fishery based communities • Pairing sustainable energy production with sustainable water management
Middle East and North Africa	• Coping with the further exacerbation of longstanding problems of recurrent droughts • Health risks of poor water quality among rural populations and low-income groups in urban areas • Adaptation through the scaling up the use of lower-quality waters (saline and wastewater)
Latin America and the Caribbean	• Institutional arrangements that address immediate needs as well as the longer-term challenges associated with adaptation to reduced rainfall and increased desertification • Glacier melt and its subsequent effects on river levels • Using pricing mechanisms as a means of increasing water use-efficiency while reducing vulnerability and ensuring water security • Innovative governance structures to address growing conflict over water use