

STRENGTHENING CLIMATE CHANGE ADAPTATION RESEARCH —

MOBILIZING AND ENABLING INTERNATIONAL RESEARCH PARTNERSHIPS

THE SUMMARY REPORT ON THE INTERNATIONAL WORKSHOP

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Executive Summary

As highlighted in the recent Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change, there is unequivocal scientific evidence that global climate is changing. Although one cannot predict exactly how the climate will change, or where and when it will be felt most severely, it is an inescapable fact that change will occur because of anthropogenic causes. Both Canada and less developed countries need to understand how societies and economies can minimize the negative long-term consequences of these changes by developing effective adaptation measures. Canada, and all other industrialized countries, have both a moral responsibility and vested interests in helping others plan for adaptation to ongoing climate change.

The International Development Research Centre (IDRC) convened this meeting to explore ways to mobilize and organize international research partnerships involving Canadian researchers and funding partners. Presentations of both regional and thematic perspectives were followed by discussion of research priorities and the elements and modalities that would constitute effective research partnerships. Participants agreed that there is a range of activities where collaboration between researchers from Canada and developing countries will bring mutual benefits and could facilitate progress to solve some of the most urgent problems that people from the South and the North are facing now as a consequence of changes in the climate. General consensus was that multidisciplinary, action research was a prerequisite to success. This research will be far from easy; it will indeed be scientifically challenging. Canadian researchers have much to gain from interaction with Southern researchers, who have, in many cases, made advances in methodological approaches to this type of research. Important for success are mechanisms to engage Canadian and Southern scientists in discussions of areas of interest and to facilitate funding collaboration among Canada's major grant-making institutions. Young researchers and students are key resources and will play central roles in the process.

This meeting was a first step in the creation of an international dialogue to engage community leaders, scientists, and political decision-makers and policymakers in a process of research-based adaptation to the problems associated with global climate change. To continue this effort, IDRC will soon convene a second meeting among potential Canadian funding partners to explore the mechanics and details of an initiative to encourage and support international research partnerships around adaptation to climate change, and will continue to keep participants informed of future developments.

This report outlines the context and objectives of the meeting, highlights key points made during presentations, and proposes the next steps in mobilizing international research partnerships related to climate change adaptation.

Context and Workshop Objectives¹

In Canada, the corporate sector, the public, and governments are keen to understand better what climate change entails. Much of the current political debate centres on how to avert the threats or to capitalize on the opportunities created by climate change, and a number of domestic programs for action and research have been launched or restructured.

Internationally, debate has been triggered by the Stern Report,² which was released by the UK government in October 2006, and the recent outcome of the November 2006 Nairobi Climate Change Conference.³ The Stern Report recognizes that: “it is no longer possible to prevent the climate change that will take place over the next two or three decades, but it is still possible to protect our societies and economies from its impacts to some extent through effective adaptation measures.”

IDRC President, Maureen O’Neil, noted in her opening speech that: “We have a global challenge before us demanding scientific collaboration and collective political action. Whether you view Canadian participation in climate change research as science for humanity or in the national self-interest, Canadian science has much to contribute to, and to be enriched by, international collaboration.”

IDRC has long supported research to buffer the effects of climate variability. Research collaboration with Southern-based scientists has addressed agricultural and forestry practices, watershed management, land and water conservation, measures to combat desertification, and protection of biodiversity. These efforts take on new relevance in light of climate change. Most recently, IDRC launched the Climate Change Adaptation in Africa⁴ research and capacity development program, which is jointly funded by IDRC and the UK Department for International Development (DFID).

¹ Based on opening remarks by Maureen O’Neil, President, International Development Research Centre (IDRC) and John Stone, Senior Sabbaticant, Rural Poverty and Environment, IDRC, and Vice-Chair of Working Group II, Intergovernmental Panel on Climate Change (IPCC).

² http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/sternreview_index.cfm

³ <http://unfccc.int/2860.php>

⁴ For more information: <http://www.dfid.gov.uk/research/climate-change.asp> and <http://www.idrc.ca/ccaa/>

Over the past number of years, IDRC has noted that a broader cross-section of the Canadian research community has begun to turn its attention toward global challenges. In response, IDRC established the Research Partnerships Challenge Fund to facilitate the development of larger-scale research programs. This fund has been used to develop Canada–South research alliances in collaboration with the Canadian Institutes of Health Research, the Networks of Centres of Excellence Program, the Canadian International Development Agency (CIDA), and Health Canada. IDRC intends to use the Challenge Fund to develop theme-based research programs supported in conjunction with other Canadian research funding partners and possibly international funding partners.

Maureen O’Neil closed by noting three points: (1) there is a strong rationale for collaborative and comparative research on climate change and adaptation; (2) Canadian researchers have limited opportunities to organize international research alliances on issues of mutual interest; and (3) IDRC has a primary mandate to support research in the South, and Canadian government departments and research funding councils have a mandate to build Canadian expertise. However, “we also have the choice to do things collaboratively ... I hope that we will be able collectively to identify priorities and think through appropriate mechanisms to facilitate comparative and collaborative research on adaptation to climate change. We have an opportunity to advance science and public action on one of the most important questions of our time.”

Picking up on this theme of collaboration, John Stone challenged participants to address the question of how to best encourage and reward Canadian scientists to put their scientific expertise to the service of development. He noted: “the time has come to be creative and explore mechanisms that would have Canadian scientists look outside the confines of their disciplines and respond to the urgent needs of individuals and communities in developing countries. I am convinced we have the talent, what I believe we need is an appropriate reward system.” Canadian researchers as they broaden their focus to global challenges, have the opportunity to make significant contributions to international scholarship on complex issues that affect both Canada and the world.

Public concern about the effects of climate change has a solid basis in science: there is no longer any doubt that climate change is real, that it has been unequivocally detected, that some impacts are already evident, and that human activities — mainly the burning of fossil fuels — are very likely the cause of most of the warming. The scientific case, as

demonstrated in the recently concluded IPCC Working Group⁵ I AR4 Report, is now well established. The debate on the science is effectually concluded ... over the next two decades at least, further global temperature increases of 0.2 degrees per decade are inevitable.

Although one cannot predict exactly how the climate will change, or where and when it will be felt most severely, it is an inescapable fact that change will occur because of what we have already done and are continuing to do to the composition of the atmosphere. Further impacts are inevitable and adaptation is an unavoidable imperative. We are locked into the impacts that will occur over the next two to three decades. This imperative is particularly acute in developing countries where, because of resource limitations, the capacity to adapt is low and hence their vulnerability to climate change impacts is likely to be greatest. These countries are often subject to other stresses such as disease, civil strife, and poor infrastructure that make the problems worse. As was concluded in the IPCC Third Assessment Report, climate change is likely to exacerbate the disparities between the rich and the poor and between developed and developing countries, and this disparity will increase as climate change increases.

The number of natural disasters per year is increasing, and three-quarters of these disasters are accounted for by floods, storms, and droughts. Changes in the global climate are having three profound impacts: sea level rise due to thermal expansion of the oceans and ice sheet melting; extreme weather-related events are becoming more extreme, and although their duration is short their impacts are long-term and can be catastrophic; and precipitation regimes are changing (more rain in wet places and more drought in drier ones).

Canada, and all other industrialized countries, have both a moral responsibility and vested interests in helping others plan for adaptation to ongoing climate change. Anthropogenic emissions of greenhouse gases continue to be centred in the North, but the effects are often most severe in the South. Failure to address these issues will inevitably lead to water and food shortages, conflict, and potential strife and suffering. The costs associated with humanitarian assistance, peacekeeping, and disaster mitigation will continue to grow and will inevitably divert resources from development

⁵ For information on the Intergovernmental Panel on Climate Change and links to reports: <http://www.ipcc.ch/>

assistance. However, countries with a healthy and prosperous economy, adapted more robustly to the impacts of climate change, will be stronger trading partners for Canada, providing markets for technologies and raw materials for industries. Canada has a vested interest in the integrity of the environment in these countries, on which we depend for essential goods and services.

Adaptation research faces other challenges. It cannot be addressed as if it were a simple technical problem. As illustrated in the North, it involves questions of institutions and governance. Inputs from both the social and the natural sciences are imperative. Although adaptation can be facilitated if there is an appropriate institutional environment, the social context in which adaptation must take place needs to be understood. These are very complex tasks. No single researcher or institution can hope to address these issues in isolation. A significant increase in the number and scope of joint international initiatives involving Northern and Southern researchers is an effective mechanism to confront this challenge. Researchers and institutions in both Canada and developing countries have much to gain from collaborative efforts to improve the capacity of humans to adapt to climate change.

Time to Act

The congruence of public and government interest, and the urgency to provide research-based solutions on how to adapt to our changing climate, makes this an appropriate time to address issues and chart a course of action. IDRC's mandate⁶ includes fostering alliances and knowledge-sharing between scientific, academic, and development communities in Canada and the South. Mechanisms exist within IDRC to develop theme-based activities with Canadian and developing-country partners, and to provide research collaboration opportunities for these scientists.

The links are clear among climate change, international development, environmental management, and disaster management. The responses and actions of all partners must be interdisciplinary and focused on making a change "on the ground." This meeting was an important step in the creation of an international dialogue to engage community leaders, scientists, and political decision-makers and policymakers in a process of research-based adaptation to the problems associated with global climate change.

⁶ For more information on IDRC and its mandate: <http://www.idrc.ca>

The balance of this report presents brief regional and thematic perspectives. It summarizes the outcomes of discussions of the working groups with regard to research priorities and the design and funding of a research program on collaborative international research on adaptation to climate change.

Regional Perspectives

Brief presentations were made to set the context within each of the main developing regions. The objective was to give an overview of the research being undertaken, identify major research gaps in research on adaptation, and suggest priorities for further research.

Africa (Balgis Osam Elasha⁷) — Current efforts tend to focus on relief and short-term plans. Research that is conducted tends to look at effects, not longer-term adaptation options. There are many recent examples of the effects of extreme climate impacts in Africa. One third of all African people (220 million) live in drought-prone areas.

Priorities for Africa include the need for Africa-specific research on multiple stresses, sector-specific research done in an integrated manner, capacity building to understand the nature of vulnerability and adaptation in Africa, policy-relevant research, the application of lessons to adaptation actions, impacts and adaptation to future variability and extremes and within unique and threatened systems, the links between climate change, land degradation and desertification, and an examination of potential areas of conflict due to climate change.⁸ Some of the gaps in research include: deficiencies in regional coverage (Central Africa least covered, East and West better than North and South); generation of location-specific knowledge (and feeding this data into existing and new models); tools and methods for vulnerability and adaptation assessments; and the need to improve communication and the use of knowledge in sectoral planning and action. The need to link the work of researchers with decision-makers and the communities, and the inclusion of traditional knowledge, are areas where synergies could be achieved through comparative studies.

⁷ Higher Council for Environment and Natural Resources, Sudan.

⁸ For more information: <http://www.aiaccproject.org/>

Asia (Daniel Mudiyarso⁹) — Impacts can be expected to be most severe in low-lying coastal areas (the home of 500 million people spread over 300,000 km) and in the six megacities that account for about 30% of the region's total population. Asia has 175 million hectares of tropical forests that are being deforested at a rate of about 2.5 million hectares per year. The worst-case scenarios of the climate 100 years from now suggest that average temperatures could rise by as much as 6-10°C, that rainfall patterns will change by between 15 and 50%, and that forest cover will decrease dramatically. Projected impacts on water and food production will be inevitable and profound, as will associated geo-hazards such as landslides, especially in areas of high population density. Despite the urgent need for adaptation actions, mitigation currently gets more policy attention than prevention and adaptation research.

Opportunities exist to help address science–policy gaps. Research is required on how to: assess vulnerability; develop adaptive criteria and indicators; and find mechanisms to involve the private sector. Research must be designed to: enhance local capacity; engage local populations; adopt local agendas; and examine and adjust to possible mismatches.

Latin America (Holm Tiessen¹⁰) — Some issues of importance to Latin America are the need to: understand climate change and variability and how the vulnerability of different regions will be affected; find effective ways to assess risk and vulnerability; strengthen research and build capacity (especially in governance), and improve the communication of science and promote its use in decision-making. There is good science in Latin America, but effective mechanisms are needed to harness this science for action through the creation of new types of partnerships.

Precipitation abnormalities abound in Latin America. Droughts are a possibility in all regions and preventative adaptation is essential both for agricultural systems and for water management. People are aware of the effects of El Niño, but there are important non-El Niño risks that are related to climate change. These social issues are critical and require the strengthening of civic infrastructures.

Latin America has a number of institutes with high levels of expertise that are working in areas of research that have potential positive links for both Canadian and Latin

⁹ Center for International Forestry Research, Indonesia.

¹⁰ Inter-American Institute for Global Change Research, Brazil.

American scientists and their intended beneficiaries. Cooperative networks have been established that include 40 institutions in 18 countries; therefore, many points of potential interaction exist.

Caribbean (Ulric Trotz¹¹) — Risks due to extreme hydroclimatic events (floods, drought, landslides, and hurricanes) are the most prevalent, and such events are becoming more severe. The Barbados Programme of Action for Sustainable Development¹² includes three imperatives: capacity building; addressing the current situation; and implementing adaptive measures. Ongoing research is: undertaking risk and vulnerability assessments and impact studies; shaping regional responses with regard to disaster mitigation; improving the resilience of people and systems (adaptation); and undertaking capacity building in all these areas.

Potential areas of collaboration include: use and interpretation of models; trend analysis and downscaling; developing region-specific climate-change scenarios and regional adaptation projects; undertaking vulnerability studies; looking at climate-change impacts; developing early warning systems; undertaking cost–benefit analysis; looking at links between biodiversity and climate change; developing a best practices guide for mitigation of disasters; and developing a regional threshold for climatic stabilization.

Thematic Perspectives

Canadian researchers reviewed current research advances in Canada in relation to adaptation to climate change, identified where Canada could benefit from research collaboration, and highlighted relevant Canadian experiences. These summaries built on the discussions of regional perspectives to set the stage for working group discussions around five themes: (1) Agriculture, Rural Communities, and Food Security; (2) Human Health; (3) Water Security; (4) Disaster Prevention and Management; and (5) Livelihoods and Social Processes.

Agriculture, Rural Communities, and Food Security (Mike Brklacich¹³) — Canadian researchers have established the foundations for climatic change – agricultural impacts research at a national and international level, and are working on broadening the

¹¹ Caribbean Community Climate Change Center, Belize.

¹² For more information: www.sidsnet.org/docshare/other/BPOA.pdf

¹³ Carleton University, Ottawa.

research agenda to include mitigation and adaptation. An appropriate balance is needed when looking at impacts and adaptation, with considerable more emphasis given to the human dimensions.

Some important gaps in agricultural research relate to: food security (food supply issues can be assessed, but there is less ability to address food entitlement, food access, and human livelihood perspectives); and rural communities (where the focus is on production agriculture with less attention on the food security of rural communities). Climate change and agriculture adaptation research must be linked to the food security of rural communities. Research on food security must also move beyond a supply focus and incorporate issues related to access and livelihoods. As well, work with rural communities must move beyond considering isolated communities, resources, and engineering perspectives, to consider community security. A comprehensive approach to vulnerability and security is needed to both integrate food security and rural communities, and strengthen climate change adaptation research.

Human Health (Dominique Charron¹⁴) — Climate change and its impacts all operate within a very complex system. In Canada, it is in the North that climate change is having the greatest immediate impact. These impacts include: the disappearance of snow and ice in summer and drinking water shortage; unpredictable and more severe storms hazardous to travel and hunting and fishing safety; respiratory problems from heat; and spoilage when using traditional food storage and preparation methods. As well, changes in marine and terrestrial wildlife and fish have direct links to food security (70% of aboriginal adults hunt and fish for subsistence); wider distribution of disease vectors is exposing people to new diseases; and economic security is challenged by threats to traditional livelihoods. A new study, entitled National Assessment of Health Vulnerabilities to Climate Change, will be published by Health Canada in 2007. Additional details on Canadian concerns over human health and climate change are available online.¹⁵

Water Security (Lawrence Martz¹⁶) — Within the water sector there are clear concerns about the impacts of climate change on the hydrological cycle. The principal driver of research has been global concern and the need for scientific investigation of climate change. This has led to a synthesis of hydrologic knowledge on a global scale and a

¹⁴ IDRC, Ottawa.

¹⁵ For information on Climate Change and Health: http://www.hc-sc.gc.ca/ewh-semt/climat/index_e.html; for research links and bibliographies: www.eccho.ca

¹⁶ University of Saskatchewan, Saskatoon.

greater appreciation for the complex nature of the problems and the need for interdisciplinary approaches to solve them. The use of remotely sensed data and modeling is making important contributions to understanding the critical linkages, feedbacks, and thresholds in the global water system. Canadian research has become more interdisciplinary, and there has been a greater realization of the importance of the “people-side” of research. Decreases in the water sector are 80% due to human activity and 20% due to climate change, but climate change in combination with population change is expected have stronger impacts.

An example of global science with regional comparisons is the Global Energy and Water Cycle Experiment (GEWEX), which measures, models, and predicts global water regimes. The Canadian component of GEWEX is studying the Mackenzie basin to: understand and model the linked hydrologic-atmospheric system; provide tools to predict system response to climate variability and climate change; enhance the Canadian skills in hydrology and climatology; and contribute to resolution of global issues related to water and climate.

Canadian researchers can be expected to have to address many new issues related to climatic changes, including: matching stream flows with the needs of diverse users; measuring the economic and social effect of climate change; understanding the relationship between climate variability and extreme events; anticipating changes in land use; and assessing the attendant economic, legal, and policy dimensions.

Disaster Prevention and Management (Gordon McBean¹⁷) — Risk includes two components, hazards and vulnerability. Hazards are potentially damaging physical events, phenomena, or human activity that may cause the loss of life or injury, property damage, social and economic disruption, or environmental degradation. Vulnerability includes the conditions determined by physical, social, economic, and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards. Disasters result at the intersection of hazard and vulnerability, and can be defined as a serious disruption of the functioning of a community or a society causing widespread human, material, economic, or environmental losses that exceed the ability of the affected community or society to cope using its own resources.

The number of natural disasters per year is increasing, and 75% of these disasters are accounted for by floods, storms, and droughts. Therefore, climate change and disaster

¹⁷ University of Western Ontario, London.

management, as well as international development and environmental management, are closely linked. It must be recognized that the economic effects of these disasters are much greater in developing countries. Efforts to develop new approaches to disaster management must address four important components: response; recovery; preparedness; and mitigation.

Canada has many leading scientists working on natural hazard mitigation and climate change adaptation and an array of research institutions [e.g., Environment Canada, the International Institute for Sustainable Development, the Canadian Climate Impacts and Adaptation Research Network (CCIARN), the Canadian Foundation for Climate and Atmospheric Studies (CFCAS), the National Roundtable on Environment and the Economy, the Institute for Catastrophic Loss Reduction, and ArcticNet]. An on-going concern is how to ensure that science-based information is brought to bear on Canadian domestic and international policy development related to climate change and associated issues.

Livelihoods and Social Policy (Christopher Bryant¹⁸) — Individuals are the most important actors to deal with, and work must be conducted at both the individual and community level to understand decision-making by individuals, families, and communities. However, these groups and the stressors they face are heterogenic, which stresses the need for a holistic approach. The capacity to adapt is culture-based, and approaches must welcome and foster engagement and initiative by individuals and community groups. These factors have important implications for social policy, which must be able to address differences in both individuals and communities.

Challenges to the development of effective social policy include the need to build the capacity of individuals and communities to deal with change, from climatic trends and events and from other sources of stress. Equally important is the need to develop capacity in senior government personnel.

Some research priorities include: actor-based research (involving individual, community, and government actors); action-research aimed at bringing actors to better understand their roles and functions and to take appropriate action; a focus on social capital; and taking a holistic perspective as opposed to a reductionist one.

¹⁸ University of Montreal, Montreal.

Working Group Discussions

The participants broke into working groups to address such issues as: what research gaps on adaptation to climate change are common between Canada and developing countries; what research questions merit comparative investigation; how might these questions advance science and policy; and what sort of mechanism would facilitate collaborative research efforts? Given the level of convergence, the major points of discussion have been grouped into three broad categories: research questions and opportunities; design of a research program; and funding mechanisms and opportunities. These areas could form the basis of a research agenda for a new collaborative program.

Research Questions and Opportunities

Multiple Stressors

Any discussion of climate change must recognize that there are multiple stressors linked to global and climate change. For example, the combination of climatic change with population changes will have an even stronger effect and will be accentuated over time. Therefore, it is important to retain an appropriate balance between considerations of the human and physical aspects. This realization points to the need to broaden the research focus to ensure coverage of multiple stressors using comprehensive scenarios. As an example, it was noted that in the water sector, the research has become more interdisciplinary and there is now greater recognition of the human dimension.

Economic Impact

The economic impacts of disasters are huge. Massive disasters in the United States have accounted for as much as 1% of GDP, but in some developing countries the level of destruction has been as high as 75% of GDP (e.g., when Honduras was hit by Hurricane Mitch). Effects at this level are catastrophic to national economies and people. The high and growing costs of relief and response to disasters can also set back development assistance as funds are diverted to relief efforts.

Efforts are on-going to move to prevention and mitigation, and there are many common elements between disaster mitigation and climate adaptation. Both developed and developing countries need to understand better the reasons for the ineffectiveness of current policies, and new research is required on innovative ways to spread risk.

Localized Modelling

Prediction of climate change and impact depends on models. The Global Energy and Water Cycle Experiment¹⁹ (GEWEX) measures, models, and predicts global water regimes. However, appropriate data are needed to make models effective locally. Lack of regional and local data for existing models and lack of appropriate local models can lead to inaccurate predictions. There is a need to downscale climate scenarios to the social watershed level and familiarize researchers with the available tools. Comparative research using regional data could also help to validate or revise global models.

Vulnerability and Resilience

For adaptation research to be successful it must define the science, the risks, vulnerability, costs, and propose actions to affect policy change. The elements of vulnerability and resilience must be understood, and human vulnerability must not be seen as a “residual” to global environmental change. There is still a research gap in properly defining vulnerability and resilience, both in general and under more specific contexts (e.g., food, water, and health). Researchers need to agree on more quantitative indicators to define perceived risks and vulnerability for specific communities or human groups.

Focus on Hot Spots

Climate change is gradual, and gradual change does not elicit public action in the same way that sudden events can focus public attention. It was suggested that research should focus on topics where the impact was most pronounced and attributable to climate change and variability. Such topics would be ripe for climate-change adaptation research because they would illustrate the value of action-research in this area and also demonstrate how policy changes can help mitigate the adverse effects of climate change.

The plight of environmental refugees and urban impacts of migrations of rural populations to mega-cities are important issues. Other examples of areas of high priority were suggested. The reduction of Andean glaciers, which are trans-boundary, already slush-like, and creating an imminent threat of landslides all require research. Elements of the required research relate to disaster risk, water supply, and environmental degradation. There is also a need to improve knowledge about action research among those interested in adaptation to climate change. Much of this research sits in drawers.

¹⁹ For more information: <http://www.gewex.org/>

It is important to publicize this work and to extract lessons about what works and does not work and make it available to decision-makers. Furthermore, there is a need to provide assistance in the development of national adaptation plans.

Mutual Interests

Both Canadian and Southern researchers noted the potential that exists for mutual benefit from scientific and policy outcomes through comparative and collaborative research design. Crucially, these lessons and experiences can be expected to flow in both directions from collaborative research. Such productive collaboration is not only desirable, but welcomed by both Canadian and Southern researchers.

Ways must be found both to promote Canadian expertise and willingness to collaborate with Southern partners and to broaden the scope of Canadians as they look for research partners and research opportunities. One of the key issues that needs to be addressed is how best to facilitate and encourage these collaborative efforts. It is crucial that these teams include a mechanism for equitable involvement that encourages the exchange of scientific capability, insights, and technologies and the engagement of young researchers.

Capacity Development

Programs of research into climate change adaptation must be sustainable. This will require efforts to ensure on-going institutional engagement and the creation of opportunities for young people to become involved in appropriate research projects. Research must enhance local capacity, engage local populations, adopt local agendas, and adjust to possible mismatches. To achieve this objective, public consultations need to be built into the research process, and all potential stakeholders, actors, and users must be included.

Effective ways must be developed and used to engage these stakeholders. This requires a deliberate process for engagement, and those who must be engaged varies with the situation and local conditions. Major funding institutions and political leaders must be included in the process. However, researchers are sometimes reluctant to do this, or have limited experience or methods. Capacity must be developed in the skills and expertise needed to conduct action research. In many cases, a good level of expertise and skills has already been gained by Southern researchers, and clear synergies are perceived through collaborative and comparative North–South joint research. It is through such convergence of interests and experiences that Canadians stand to learn a great deal about community action from their research partners, while helping to address some issues of major relevance for developing and developed countries.

There is also a need to improve the capacity of people in government. Strong political signals have been given at international meetings regarding climate change. It may be useful to encourage secondments of government employees into development banks and other donors and vice-versa to encourage understanding and influence policy development. Researchers must also learn how to frame their work in such a way to policymakers take action. This is a common need in developed and developing countries.

Scaling Up

Comparative investigations are required to determine what works and does not work. Both top-down approaches and local self-reliant (bottom-up) approaches must be considered. Can bottom-up approaches work on a large scale? These considerations need to be part of long-term program planning.

Design of a Research Program

Wide Research Agenda

It is important to broaden the sustainable development research agenda to include climate change mitigation and adaptation research. In setting the agenda, it is necessary to ensure that people and the security of rural and urban communities are the focus. Research, to be effective, must be actor-based, action-based, focused on social capital, and take a holistic perspective. This, by necessity, will mean that research must develop transitional processes and mechanisms that help people understand and manage change, lead to improved extension and communication services, and encourage and support institutional adaptation.

In this regard, it is crucial for governments to create a demand for scientific input into political decisions and the development of public policy. To achieve this objective, it is necessary to better understand how to communicate with policymakers. Given that health is a central issue for most governments and is of public concern, it may provide the best potential in-road to policy and an effective way to learn how to influence action and behaviour.

Making links between science and policy development are critical. An important question is how can research results from different regions be better used to inform policy? Adaptation tends to get lost in policy circles. Developed and developing countries need to understand better the reasons why current policies are ineffective and where they are effective.

Interdisciplinary

Creativity is required to find new mechanisms to help people adapt to climate change. For this reason, both natural and social scientists must be encouraged to address these issues in new ways. It is no longer acceptable to undertake research focused on single issues with methods that do not embrace interdisciplinary perspectives. There are no simple technical solutions. Inputs from the natural and social sciences must be blended in an environment that encompasses considerations of institutions, governance, and social structures.

Adaptation is linked to underlying social processes and cannot be viewed as a separate entity. The process of adaptation must be integrated into other ongoing programs such as poverty reduction strategies. This will require groups of researchers from various disciplines working on common issues. As well, work with stakeholders needs to be done well in advance to pull together and engage them in meaningful discussion about information and resource needs (why is research needed), research agendas (what the research could produce), and how it could be applied (use of research results).

Action Research

It is important to define what is meant by action research and provide guidance on how it can be implemented. Action research has been promoted by IDRC for many years, and IDRC provides opportunities to link Canadian research teams with experienced researchers in developing countries. As part of the action research process, all of the “drivers” must be identified and the research must include a component to mobilize activities within communities.

Researchers will require encouragement and training to be able to work with the broader range of actors who are important (e.g., industry, NGOs, local governments, and local communities). Lessons from action research can also be used by Canadian researchers in work they undertake in Canada.

Multi-Stakeholder Involvement

People-based systems are complex. Individuals are the most important actors to deal with; however, work must be conducted at both the individual and community levels to understand values and decision-making for individuals, families, and communities. The role of traditional environmental knowledge must also be considered and its role in the decision-making process understood. Scientific and academic communities in Canada traditionally have little experience in action research and in communicating with governments; therefore, nongovernmental organizations (NGOs) and other community-based groups can be important actors.

It is essential to understand the roles of all stakeholders and to recognize that stakeholders can change over the life of the project. One research objective might be to encourage and include those “outside the margins” to become involved. Projects with research and development agendas that are pertinent to all stakeholders will have fewer issues with dissemination.

Timeframe and Orientation

An overall objective should be to increase the scope of projects (5-year research strategy and a 10–20 year vision) and to get adaptation research “mainstreamed” into other sustainable development activities. To achieve this objective, dialogue is needed on a regional basis to identify local needs and to promote partnerships that are oriented South–North rather than North–South.

Build on Existing Structures

A key question for many researchers is: How do you implement adaptation research? Any activities that are planned should take advantage of existing programs and experiences. The science of adaptation is not underdeveloped. Many related disciplines have produced knowledge that is simply labelled differently. For example, zero tillage agriculture has existed for years. As well, action research is already in place in many projects.

Any “new” initiative should also be built on the foundation already established through such programs as: the Canadian Institutes of Health Research²⁰ (CIHR); Global Change System for Analysis, Research, and Training (START); The Inter-American Institute for Global Change Research (IAI); the Consultative Group on International Agricultural Research (CGIAR); the Water Challenge Program of the International Water Management Institute (IWMI), and others. As well, links might be established with the research chairs program in Canada, and lessons from such experiences as the International Model Forest Network²¹ and the Community University Research Alliances (CURA) program.

²⁰ For more information: CIHR <http://www.cihr-irsc.gc.ca/>; START <http://www.start.org/>; IAI <http://www.iai.int/>; CURA http://www.sshrc.ca/web/apply/program_descriptions/cura_e.asp; CGIAR <http://www.cgiar.org/>; IWMI <http://www.iwmi.cgiar.org/challenge-program/index.htm>

²¹ For more information: http://www.idrc.ca/en/ev-22891-201-1-DO_TOPIC.html

Reward System

A modified tenure and reward system is ideally needed. This is a challenging task to be undertaken by university administration and peers. In the meantime, a research program that encourages wide-spread participation across the disciplines and generations of scholars will need to introduce specific rewards for challenging and time-intensive research. Participants noted the need to encourage “field building” in the area of climate-change adaptation and with this, the importance of bringing in new scholars.

Several of the design features of a research program present obstacles for young Canadian researchers seeking to get involved in this area. Larger-scale research teams, and multi-sited research, require time commitments from researchers. These features are incompatible with the demands on younger faculty and their need to deliver short-term outputs for promotion. Interdisciplinary, multi-stakeholder action research should be recognized as being “hard” both in terms of being difficult to undertake and as producing substantive results based on rigorous scholarship. Research programs that introduce rewards and encourage dissemination and promotion of action-research can help overcome some of the difficulties mentioned by participants. To further interest in such activities, a prestigious award might be launched for adaptive research in climate change.

Outcome Expectations

When assessing proposals for funding, it is important to assess their potential outcomes. What evidence is there that adaptive capacity is likely to be enhanced or improved? The end product of action research should not be a thing, but rather a change in behaviour or capacity. The effectiveness of both policy and research should be assessed on the basis of whether it is helping people change their knowledge, attitudes, or practices. Researchers should always ask “are we doing the right things” and constantly question what is being done and why.

Communications and Use of Results

Despite an increase in scientific knowledge, vulnerabilities continue to increase. It is important to understand how to inform and influence policy and decision-makers, and how to frame these actions to support and encourage policymakers to take action. Awareness building among leaders is necessary and requires communication, education, and information dissemination. Equally important is the delivery of results to end-users. Appropriate communication and dissemination activities should be developed and undertaken as part of grant proposals.

Scientists are generally not good at communicating results of research to people who can make decisions. Training is needed to improve their ability to communicate with

specific types of audiences. However, the converse is also true. Decision-makers are not necessarily good at communicating with scientists. There continues to be a need to improve global science exchanges and to increase information sharing among scientists, whether in the North or South.

Dissemination and communication of research often assumes researchers have the right information to disseminate. A fundamental part of research must be to determine how decisions are made and what information is needed. It is also necessary to take care in defining who the “users of research results” really are as these people are not necessarily those who need to adapt directly.

Funding Mechanisms and Opportunities

Funds are available within Canada to support climate-change adaptation research. As can be seen from the following summaries, extracted from the final panel, IDRC has resources to engage developing country expertise, and the Canadian granting councils and other agencies have an interest in funding Canadian researchers working on climate change in international endeavours. However, both IDRC and the granting councils tend to work in their own niches. The lack of suitable mechanisms for funding joint research between Canadian and Southern researchers has constrained Canadian efforts to undertake comparative research on global issues. Targeted support is required to help scientists and institutions work together on proposal development. An important consideration is to review the different funding mechanisms in different organizations to look for ways to bring these together to make it easier to develop collaborative mechanisms and discuss collaborative research.

Canadian Commitment²²

The presentations and subsequent discussions confirmed that these organizations provide important support for research in their areas of expertise. As well, they all have existing mechanisms to encourage partnerships to leverage additional resources and expertise and are all willing to discuss opportunities for collaborative research between Canadian and Southern researchers on adaptation to climate change.

Natural Resources Canada (Don Lemmen) — Studies of impacts and adaptation to climate change are being conducted across Canada through the Canadian Climate

²² Presentations were made by representatives from each of these organizations. For more information: NRCan www.nrcan.gc.ca/; SSHRC www.sshrc-crsh.gc.ca/; NSERC www.nserc-crsng.gc.ca/; CIHR www.cihr-irsc.gc.ca/; CIDA <http://www.acdi-cida.gc.ca/>; and IDRC <http://www.idrc.ca>

Impacts and Adaptation Research Network (C-CAIRN) (since 2001, \$15 million has been invested and 120 researchers involved). C-CAIRN proposals are interdisciplinary, take a systems approach, and are evaluated on two levels: scientific validity and how it will make a difference. Focus is on the need to generate knowledge and achieve action. Opportunities exist to learn about community action from developing country researchers and exchange experiences. As we grapple with new impacts and how to adapt, co-learning can be expected to have enormous benefits for Canada.

Social Sciences and Humanities Research Council (SSHRC) (Marc Fonda) — Environmental sustainability is a priority area, and the number of applications connected with the environment has increased in the last 5 years. SSHRC has taken a leadership role in introducing new measures that allow non-Canadian researchers to participate in SSHRC-funded research. There are also new funding programs to encourage international linkages (e.g., the International Opportunities Fund).

Natural Sciences and Engineering Research Council (NSERC) (Denis Leclerc) — Climate change and adaptation research is most closely aligned with NSERC strategic research theme on health, environment, and ecosystems. NSERC has various tools to support proposal development and meetings among partners. To support research, the “Special Research Opportunities” (SRO) grants, which can include pre-research activities, could be used to develop joint funding with developing country researchers. This modality has been used to take advantage of international scientific collaboration. NSERC has a long tradition of partnering with government agencies and industry to harness the talent of natural scientists and engineers, and would look forward to discussing opportunities with IDRC and other agencies.

Canadian Institutes of Health Research (CIHR) (Anne-Cécile Desfaits) — CIHR is a founding partner with IDRC in the Global Health Research Initiative (GHRI). Although GHRI is not directly addressing climate change, it addresses impacts on human health and the potential exists to include new initiatives. For example, in terms of capacity building, the existing “Summer Institute” program could be focused on climate change adaptation. Critical to the GHRI model is support for collaboration between Canadian and Southern scientists.

Canadian International Development Agency (CIDA) (Paul Samson) — CIDA has a long track record in sponsoring learning and action related to sustainable development. CIDA has collaborated with IDRC on numerous occasions to support action-research on topics of mutual interest. CIDA’s contribution to building a knowledge base in this area dates back to the establishment of the Climate Change Development Fund in 2000.

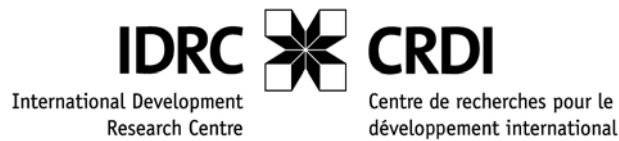
Although this fund is not research focused, it has supported a limited amount of research. Climate change is now back on the agenda in Canada, and the focus of CIDA programming will lie within vulnerability and adaptation.

International Development Research Centre (IDRC) (Jean Lebel) — IDRC's mandate is to provide funds for research in the South to help Southern researchers seek their own solutions through research. IDRC staff aid this process through pro-active leadership and, for example, supporting research networks. Partnerships can take various forms: researcher to researcher; partnerships with Canadian funders (e.g., CIHR and the GHRI); support to national centres of excellence; and international partnerships (e.g., DFID and Climate Change in Africa initiative).

Immediate Follow-up Action

In his closing remarks, Rohinton Medhora, Vice-President of Programs, IDRC, acknowledged the commitment and contributions all participants had made during the packed two-day workshop. He noted that this was best indicator of the importance of the tasks that had been undertaken. Additional steps are needed to move forward with the initiative of bringing researchers from Canada and developing countries together to help address perhaps the most pressing problem of our time: reducing the impact of climate change on the most vulnerable communities in Canada and the South. In this regard:

- This report, as well as presentations and other materials generated during the workshop, will be made available to all participants.
- IDRC will soon convene a meeting to further explore opportunities and mechanisms for potential collaboration with other Canadian funding agencies.
- IDRC will keep all of the participants in the workshop informed of future developments.



***Strengthening Climate Change Adaptation Research –
Mobilizing and Enabling International Research Partnerships***

IDRC Workshop

**February 6-7, 2007
14th Floor, 250 Albert Street
Ottawa, Canada**

Day 1: February 6, 2007, 8:30-17:00

Morning Session

8:30 – 9:00 Registration

9:00 – 9:15 Welcome and introductions: Maureen O'Neil, President, IDRC

9:15 – 10:00 Opening presentation: Dr John Stone, Senior Sabbaticant, IDRC; Vice-Chair of Working Group II, Intergovernmental Panel on Climate Change; Adjunct Research Professor, Carleton University

An overview of the environmental, economic and social challenges resulting from climate change and the need for responsive research that can inform adaptation strategies.

What are the key challenges – in areas such as public health, access to water, food production, habitat preservation, disaster management – that would benefit from research partnerships between Canadian and developing country scientists?

10:00 – 10:15 Health break

10:15 – 12:15 Panel 1 – Regional perspectives on climate change adaptation research priorities

Chair: Mr. John Drexhage, International Institute for Sustainable Development

Dr. Balgis Osman Elasha: Africa

Higher Council for Environment and Natural Resources (Sudan)

Dr. Daniel Mudiyarso: Asia
Center for International Forestry Research (Indonesia)

Dr. Holm Tiessen: Latin America
Inter-American Institute for Global Change Research (Brazil)

Dr. Ulric Trotz: Caribbean
Caribbean Community Climate Change Center (Belize)

12:15 – 1:15 Lunch

Afternoon Session

1:15 – 3:00 Panel 2 - Canadian perspectives on climate change adaptation research priorities

Chair: Dr. Bob Scholes, Council for Scientific and Industrial Research (South Africa)

Dr. Mike Brklacich: Agriculture, Rural Communities and Food Security
Carleton University

Dr. Dominique Charron: Human Health
IDRC

Dr. Lawrence Martz: Water Security
University of Saskatchewan

Dr. Gordon McBean: Disaster Prevention and Management
University of Western Ontario

Dr. Christopher Bryant: Livelihoods and Social Policy
University of Montreal

3:00 – 3:15 Health break

3:15 – 5:00 Thematic group discussions

Following panels 1 and 2, thematic working groups will identify possible entry points for collaborative research. Parallel discussions will be held in five thematic groups with guidance from a coordinator who will help to document the discussion for report back the following morning.

What questions merit comparative investigation? How might the proposed questions advance science and policy?

Chair: Dr. Simon Carter, IDRC

Coordinator Thematic group

Dr. David Gauthier: Agriculture, Rural Communities and Food Security
University of Regina

Dr. Lilian Corra: Human Health
Argentinean Association of Doctors for the Environment (Argentina)

Ms. Bano Mehdi: Water Security
C-CIARN Water Resources / McGill University

Dr. Ian Burton: Disaster Prevention and Management
University of Toronto

Dr. Barry Smit: Livelihoods and Social Policy
University of Guelph

7:00 – 9:30 Dinner hosted by IDRC - Courtyard Restaurant, 21 George St., Ottawa

Day 2: February 7, 2007, 8:30 - 16:30

Morning session

8:30 – 10:00 Report back of thematic working groups

Chair: Dr Simon Carter

Each group will report the main issues that appeared during the discussion of their respective thematic groups. Each presentation will be followed by a question and answer period.

10:00 – 10:30 Health break

10:30 – 11:45 Priorities and recommendations

11:45 – 1:15 Lunch

Simon Anderson, Dept. for International Development (UK), will give a brief lunchtime presentation on DFID's emerging environmental change research priorities and collaborations with UK research councils.

Afternoon Session

1:15 – 3:15 Panel 3 – Research partnership strategies and program modalities

This final session will examine the research modalities and programming options that could be developed to foster international collaboration and inter-sectoral participation of funding agencies from Canada. Representatives from Canadian research funding agencies will identify relevant research programs currently supported by their organizations, and will comment on the challenges and opportunities related to enabling international research as proposed in the previous working groups.

Chair: Dr. Howard Alper, Visiting Executive, IDRC

- Dr. Don Lemmen Natural Resources Canada
- Dr. Marc Fonda Social Sciences and Humanities Research Council of Canada
- Mr. Denis Leclerc Natural Sciences and Engineering Research Council of Canada
- Dr. Anne-Cécile Desfaits Canadian Institutes of Health Research
- Dr. Paul Sampson Canadian International Development Agency
- Dr. Jean Lebel International Development Research Centre

3:15 – 3:30 Health break

3:30 – 4:00 Next steps and closing remarks: Dr. Rohinton Medhora, Vice-President, IDRC

Annex 2: Participants

First Name	Last name	Organization
André	Musy	OURANOS Consortium
Alain	Bourque	OURANOS Consortium
Anne-Cécile	Desfaits	Canadian Instituts of Health Research (CIHR)
Balgis	Osman Elasha	Higher Council for Environment & Natural Resources, Sudan
Bano	Mehdi	McGill University
Barry	Smit	University of Guelph
Bob	Scholes	The Council for Scientific and Industrial Research (CSIR), South Africa
Bruce	Currie-Alder	Policy and Planning Group (PPG), IDRC
Chris	Bryant	University of Montreal
Chris	Furgal	University of Laval
Daniel	Murdiyarmo	Center for International Forestry Research (CIFOR), Indonesia
Danielle	St-Pierre	Partnership and Business Development (PBDD), IDRC
David	O'Brien	Innovation, Policy and Science (IPS), IDRC
David	Gauthier	University of Regina
Dawn	Conway	Canadian Foundation for Climate and Atmospheric (CFCAS)
Dean	Stinson O'Gorman	Environment Canada (EC)
Denis	Leclerc	Natural Sciences and Engineering Research Council (NSERC)
Dominique	Charron	Ecosystem Approaches to Human Health (Echohealth), IDRC
Donald	Lemmen	Natural Resources Canada (NRCan)
Eleanor	Fast	British High Commission
Elizabeth	Harvey	Canadian International Development Agency (CIDA)
Francis	Adesina	University of Nigeria
Gordon	McBean	University of Western Ontario
Holm	Tiessen	Inter American Institute (IAI), Brazil
Howard	Alper	Innovation Policy and Science (IPS), IDRC
Ian	Burton	University of Toronto
Jean	Lebel	Environment and Natural Resource Management (ENRM)
John	ApSimon	Canadian Research Chairs
John	Drexhage	International Institute for sustainable Development (IISD)
John	Stone	Rural Poverty and Environment (RPE), IDRC

Juan Carlos	Alurralde	Agua Sustentable
Kansri	Boonpragob	Ramkhamhaeng University
Ulka	Kelkar	The Energy and Resources Institute (TERI), India
Lawrence	Martz	University of Saskatchewan
Lilian	Corra	Asociacion Argentina de Médicos por el Medio Ambiente (AAMMA)
Lisa	Burley	Partnership and Business Development (PBD), IDRC
Marc	Fonda	Social Sciences and Humanities Research Council (SSHRC)
Marco	Rondon	Rural Poverty and Environment (RPE), IDRC
Marjolaine	Côté	Climate Change Adaptation in Africa (CCAA), IDRC
Mary	O'Neill	Climate Change Adaptation in Africa (CCAA), IDRC
Maureen	O'Neil	President, IDRC
Meg	Barker	Canadian Foundation for Innovation
Mike	Brklacich	Carleton University
Michael	Graham	Editor/Rapporteur
Norman	Marcotte	Natural Sciences and Engineering Research Council (NSERC)
Paul	Samson	Canadian International Development Agency (CIDA)
Paul	Sockett	Public Health Agency of Canada (PHAC)
Richard	Isnor	Innovation Policy and Science (IPS), IDRC
Robert	McLeman	University of Ottawa
Rohinton	Medhora	Vice-President, Programs (IDRC).
Simon	Anderson	The Department for International Development UK (DFID UK)
Simon	Carter	Rural Poverty and Environment (RPE), IDRC
Tana	Stratton	Foreign Affairs and International Trade Canada (DFAIT)
Ulric	Trotz	Caribbean Community Climate Change Centre (Caricom)
Wayne	Lindwall	Agriculture and Agri-Food Canada