

# CANADA-CHINA COOPERATION IN CLIMATE CHANGE: THE C5 PROJECT

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**ABSTRACT:** China is responsible for 14 per cent of the world's energy-related carbon emissions, making it the second largest emitter after the United States. China has recognized the effects of climate change and is taking steps to mitigate and adapt to climate change. China became one of the first ten countries to sign and ratify the United Nations Framework Convention on Climate Change (UNFCCC). In early 2001, the Canadian International Development Agency (CIDA) approved funding for the "Canada-China Cooperation in Climate Change (C5)" Project under the Canada Climate Change Development Fund (CCCCDF). C5 was organized around four components: Awareness and Outreach, National Communications, Adaptation and Impacts and Clean Development Mechanism (CDM). The most significant benefits of C5 are an increased ability for China to address the issue of climate change (from emissions reductions through to adaptation), and improved abilities for Chinese organizations and individuals to make decisions and take action that include climate change considerations.

**Keywords:** Canada; China; climate change, adaptation, awareness, communication

## 1. Environment and China's Development

Outstanding economic growth in China has produced the second largest economy in the world, with predictions it will be the world's largest by 2025. In addition, China has 25 per cent of the world's population, and according to the latest United Nations' statistics, about 20 per cent of the world's poor live in China.

As other industrialized countries have also experienced, China's rapid economic development has had a significant negative impact on the environment. China's push to urbanize, raise the living standards of its people and become a global player have all increased industrialization and energy consumption. To meet the needs of its population, China has found itself in a climate change circle where more fossil fuels have been burned to produce energy for a country en route to

becoming a developed nation. In fact, 70 per cent of China's energy needs are being supplied by coal-fired stations. However, per capita energy consumption in China remains very low.

To address its environmental problems, China's State Council approved the *National Tenth Five-Year Plan for Environmental Protection* in December 2001. As part of this plan (2001-2005), the government has pledged to improve environmental conditions through a combination of legislation and increased investment. Great progress has been achieved in the energy field that is favorable to environmental protection, including energy conservation, energy efficiency improvement, legislation and standards. Most recently, in November 2004, China submitted its initial National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) and issued the first Medium and Long-term National Plan for Energy Conservation where strategies, goals and key areas for energy conservation, policies and measures are addressed. Meanwhile, China's Renewable Energy Law is under the process of legislation and will be issued in 2005.

## **2. China and Climate Change**

According to the International Energy Agency's estimates, China is responsible for about 14 per cent of the world's energy-related carbon emissions, making it the second largest emitter after the United States. By 2015, China will take first place in carbon emissions. Understanding the relationship between its rapid economic development and increasing strain on natural resources and the environment, China has identified sustainable development as the pathway for its development and as a key element in all decision-making processes. China has also recognized the effects of climate change and is taking steps to mitigate and adapt to climate change.

### **2.1 China's Climate Change Commitments and Interests**

China became one of the first ten countries to sign and ratify the United Nations Framework Convention on Climate Change (UNFCCC). It then established the National Climate Change Coordination Panel (NCCCCP) to implement the UNFCCC and Agenda 21 (Delphi Group, 2001), and to provide guidance on international negotiations and domestic implementation. The Committee is led by the National Development and Reform Commission (NDRC) and is composed of 15 government departments and institutions, including the State Environmental Protection Administration.

Based on its challenges, China's climate change interests are:

- To understand more about the causes and impacts of climate change, related sensitivities and vulnerabilities of different regions, and ways to adapt that also meet sustainable development goals;
- To increase technology transfer and the flow of investment from both domestic and international sources towards sustainable solutions for environmental and climate change problems; and
- To increase awareness and understanding of key decision-makers, industrial leaders, researchers, and the general public of the current problems, causes and impacts and the actions they can take to mitigate climate change issues.

### **3. C5: China as a Partner of Choice for Environment Canada**

In early 2001, the Canadian International Development Agency (CIDA) approved funding for the "Canada-China Cooperation in Climate Change (C5)" Project under the Canada Climate Change Development Fund (CCCDF).

Environment Canada's role in C5 was a natural one, based on existing bilateral cooperation. China ranks as one of Canada's most important partners in environmental cooperation and sustainable development. Since 1986, a number of agreements have been signed such as the *Memorandum of Understanding on Cooperation in Meteorology*, the *Memorandum of Understanding on Environmental Cooperation*, and the *Framework Statement on Cooperation on Environment into the 21<sup>st</sup> Century*.

The two Canadian Executing Agencies for C5 were the Environment Technology Advancement Directorate of Environment Canada and Resource Futures International for the Clean Development Mechanism. The total budget was \$4.9 million.

The overall C5 goal was to contribute to Canada's international climate change objectives through activities that address the causes and effects of climate change while contributing to sustainable development and poverty reduction. To meet this goal, C5 was organized around four components: Awareness and Outreach, National Communications, Adaptation and Impacts and Clean Development Mechanism (CDM). General objectives for C5 were:

- Stronger institutional capacity for awareness and outreach strategies and programs around climate change;

- Higher awareness by the general public and key stakeholders about climate change, its causes, impacts and potential methods to adapt to and mitigate the problems;
- Expanded knowledge and skills for key researchers to employ greenhouse gas inventory and forecasting methodologies;
- Enhanced capacity within Chinese research institutions to identify and assess the sensitivities and vulnerabilities of key sectors/regions to changing climatic conditions;
- Stronger ability of research institutions and key decision and policy makers to develop adaptation strategies that incorporate the principles of sustainable development;
- Increased ability to identify, assess and undertake technology transfer projects under the Clean Development Mechanism;
- Enhanced bilateral linkages and dialogue between Chinese and Canadian government agencies, institutions and the private sector.

With the three year mandate for C5 at an end, this report is designed to provide details on the success of the three year effort on climate change between Canada and China. This Executive Summary presents highlights of the various components. There are full details in the body of the report that show the several different layers of success, intangible achievements and above all the strong commitment by both countries to ensure the highest levels of cooperation and long-lasting results.

## **4. Results**

### **4.1 Awareness and Outreach**

Under the Awareness and Outreach component, one of the key activities was the development of climate change training materials by the Centre for Environmental Education and Communications (CEEC), in conjunction with Nanjing University. The documents were to be used by government officials, educators, journalists, and enterprises. With input from a broader group of experts, shorter versions were developed to target four key audiences: teachers, journalists, environmental protection officials, and enterprises. A final version was printed in June 2004.

The Journalists' Capacity Building Workshop was held in March 2004, with a lead-up session in November 2003, in Beijing. The earlier session allowed for journalists to provide input into the design of the formal workshop. The main

objective was to build Chinese media understanding of the issue of climate change and help journalists develop storylines that would be relevant for their audiences. A number of presentations and site visits were arranged during the week-long event, and participants were more than satisfied with their experience. By working together during the workshop, they indicated that they would team up in the future to strengthen their outreach work in China. The media then covered the Adaptation and Impacts international conference in May 2004. As a result of the workshop and the conference, media coverage on climate change has increased significantly in China.

The Youth Focused Campaign included many different sub-activities, such as China Youth Daily articles, Friends of Nature on Wheels, a Climate Change Poster contest, and the School Twinning Project, which was added to the program. The China Youth Daily produced 28 articles on climate change, providing readers with a wide perspective of climate change and its impacts. Friends of Nature on Wheels, a mobile environmental education program developed by a non-governmental organization, delivered climate change messages to school children. The Climate Change Poster contest encouraged creative talents and targeted university students, publishing a collection of selected posters with three chosen to create an outdoor bus shelter advertisement. The School Twinning Project was introduced to build a strong and sustainable capacity at a local level to deliver climate change education. One school in Guiyang and another in Vancouver were chosen to participate. Because of the dedication of the teachers and students from both schools, this activity was a great success. Students exchanged perspectives, stories and experiences related to local climate change issues and there was ongoing cultural exchange.

#### **4.1.1 Success Factors and Results**

Open lines of communication were essential for effective project implementation, especially face-to-face interaction. Trust and respect were also very important, and strong relationships were developed with the CEEC team. Necessary flexibility in design and implementation was a key factor because although a plan was developed in the beginning, partners were able to find new opportunities and introduce new and extended activities.

The ongoing commitment and creativity of the CEEC team was key to the success of the component. Superior climate change information products and tools were produced in short periods of time, and the right people were

engaged to ensure that project activities could occur. The Canadian partner credits the China team for their dedication and motivation, making the component a great success.

The Chinese partners agree with these observations and add that the component reached its objectives and expectations. China indicated that although C5 is concluding, climate change awareness and dissemination has just started and will continue beyond the project. In this way, C5 has created a sustained capacity in China. The cooperation has opened new fields for the CEEC, such as renewable energy, and will provide opportunities to address local issues such as water, health and agriculture.

## **4.2 National Communications**

Under the National Communications component, three key activities were held to assist the Energy Research Institute (ERI). The first was a study tour, held in October 2002 in Canada, during which Chinese experts learned about the Canadian experience with data collection, inventory systems and processes, and data and information handling. The knowledge gained by the Chinese experts was demonstrated in the development of an inventory framework report.

The second key activity for this component involved two methodologies training workshops, held in November 2003 and April 2004. The first was in Beijing, successfully transferring Canadian knowledge and experience with inventory methodologies and problem solving approaches. Experts continued their training with the fugitive emissions from the oil and gas sector workshop, held in Calgary. Canadian experts provided training to the Chinese participants in the area of fugitive emission methodology and inventory. Participants were pleased with the training, having gained a more detailed understanding of the methodology employed in Canada.

The third event was a methods and models workshop, held in Beijing in November 2003. The objective of this workshop was to share Canadian greenhouse gas forecasting models, tools and techniques. It is evident by the development of an emission forecasting methodology report that the training built the Chinese experts' knowledge and capacity.

### **4.2.1 Success Factors and Results**

The ability to communicate openly was a key element in ensuring success for the transfer of knowledge and experiences between both Chinese and

Canadian experts. The engagement of appropriate experts was also very important to the success of the component.

The time allotted for the workshops session was a main point as key materials were successfully covered, but additional time would have allowed for more questions, clarifications and discussions of methodological options. Further, success of this component was assured by the interest of the ERI experts in improving the quality of their inventory estimates and their greenhouse gas forecast to better assist with China's first National Communication. The interest of Canadian experts in sharing their experience and knowledge with the Chinese delegates was essential and greatly appreciated by China. It is also important to note that the participants adapted well to changes with the format of the training sessions.

The Chinese partner agreed with the Canadian point of view, and added that they are confident that all activities will continue, and that there will be ongoing cooperation among the partners. China understands that Canada is a leader in the areas covered under this component, and although it does not have the information required for replicating the same level of detail, it recognizes the benefit in continuing a learning relationship with Canada.

The Chinese team gained knowledge from Canada on the preparation of an inventory system, and when comparing Canada's system to other countries', decided that the Canadian system is where they obtained more detailed information. The discussions on emissions forecast modeling were also useful, to both Canada and China, and there are plans to continue a dialogue.

### **4.3 Adaptation and Impacts**

Key activities under the Adaptation and Impacts component include an extremes workshop and a practical attachment, under the *Identify Nature and Characteristics of Climate Extremes* sub-component.

In January 2003, scientists from the China Meteorological Administration (CMA) participated in the workshop, held in Canada. The purpose of the workshop was to strengthen the research capacity in China for understanding the links between climate change and climate extremes. Participants indicated that the Canadian experience and expertise in data analysis and extremes research are valuable for building and enhancing research capacity

in China in related fields. Following the workshop, one expert stayed for the practical attachment, which concentrated on analysis of extreme precipitation. The CMA was very pleased with the success of both these activities.

In September 2003, two back-to-back workshops were held in China. The first, a climate scenarios training workshop, was aimed at developing and enhancing the scientific and technical capacity of the Chinese scientists working in the area of climate scenario development and climate change impact, vulnerability and adaptation assessment. The workshop included lectures, interactive discussions and hands-on exercises. The second workshop focused on six themes, namely climate change policy issues; adaptation and impact assessment approach; methodologies/techniques; case studies; scenarios; and dialogues with decision and policy-makers. Researchers felt that both workshops enabled the participation of all involved.

A third highlight is the redesigned adaptive capacity training initiative, that evolved into an international scientific conference entitled *Climate Change: Building the Adaptive Capacity*, held in China in May 2004 that led to this book of papers. This conference provided an opportunity to include international researchers in dialogue and to provide input to the case studies and other component results. Experts shared their knowledge about adaptation to climate change. The conference was an excellent example of the international leadership role that Canadian scientists play in climate change adaptation science.

#### **4.3.1 Success Factors and Results**

The Canadian partner identified partnership as an important factor in the success of this component. Effective working relationships have been established and will extend beyond the end of the C5. The Canadian partner added that informed and timely action was also key, and that most researchers agreed that the adaptation policy development provided under C5 was very useful. As in all components of the C5, good communication was extremely important to achieve success.

Another success factor was the coordinated approach taken by both countries. This component has managed to stake out a unique role for Canadian experience and expertise. The selection of Chinese partners for this component also contributed extensively to its success. As well, a dynamic and flexible approach to project implementation was necessary to achieve



outputs, especially due to the SARS delay, as well as changes to the program to avoid duplication with other funding agencies.

Adaptation and Impacts team members from China agree with the Canadian team's observations, and added that key success factors included bilateral government support from NDRC, Environment Canada and CIDA. Canadian and Chinese scientists all worked together effectively to make the component successful.

The work achieved in this component strengthened the research capacity to understand Canadian and international tools, methodologies and techniques on climate change studies. The C5 provided opportunities for state and provincial policy makers to understand the impacts of climate change and appropriate policy responses, increased the participation of women in adaptation and impacts activities, and contributed to the adaptation section of the first Chinese National Communication. The C5 will provide an opportunity for policy makers and will open a window to the public on what climate change will do to China's key economic sectors. China's future work will focus on climate change and drought, socio-economic studies, and climate scenarios, as well as continued research on adaptation techniques in a wider number of sectors and regions, and further analysis of the impacts of climate extremes and their variability.

#### **4.4 Clean Development Mechanism (CDM)**

The Clean Development Mechanism (CDM) component was aimed at enhancing capacities to initiate and undertake Clean Development Mechanism projects. Activities were the creation of an operational model for the Clean Development Mechanism, outreach and networking, and a transportation case study.

The first activity, the creation of an operational model for the CDM, created an authoritative guide for those involved in the Clean Development Mechanism project cycle, including government and business. The operational model evolved into a guidance document over the life of the project. The work of this activity enhanced the knowledge and experience of the Chinese in undertaking collaborative research, and resulted in useful products that were disseminated to government policy and decision makers in China and Canada. The guidance documents were released during a Canada-China workshop on the Clean Development Mechanism, held in China in September 2003.

The second activity was the development of a Clean Development Mechanism Enterprise Network (CEN), a bilingual web site to facilitate Clean Development Mechanism project collaboration between China and Canada. This activity was redesigned at the request of the Chinese, and allowed the partners to use innovative, and originally planned, activities to ensure the results of the project were widely disseminated. While the CEN was not created, the project team identified a series of activities to participate in to raise awareness of the project. The participation in regional workshops in China allowed the project to extend its reach beyond Beijing.

The last activity under the Clean Development Mechanism component is a transportation case study, intended to test the Clean Development Mechanism operational model in the transportation sector. The activity included two study tours to Canada for Tsinghua University researchers. An official from the Beijing Public Transport Corporation also participated in one of the tours. Capacity was developed in survey methodologies, research methods, and identification and evaluation of potential Clean Development Mechanism projects. Partners developed an improved understanding of the Clean Development Mechanism and its applicability in the transportation sector.

#### **4.4.1 Success Factors and Results**

The Canadian partner identified open lines of communication as an important issue. Face-to-face meetings were crucial and therefore more frequent in the second year of the project. Trust and respect were also key in this component as well, ensuring collaboration and innovation and allowing the project to attain and exceed expected results.

The engagement of appropriate experts was a successful factor for the Clean Development Mechanism component. A number of Canadian and Chinese experts were involved in the delivery of this component and proved essential to its success. High level support from both countries contributed, as did a dynamic and flexible approach that helped achieve outputs. Private-public sector partnerships were effective in project implementation, and Resource Futures International worked closely with Environment Canada throughout the project.

The Chinese partner agreed with the factors outlined by the Canadian partner, but indicated that problems occurred because of distance. He added, however, that trust and respect were a positive experience and that responsible government agencies provided a high level of support. China

indicated that the training materials were used to raise capacity in both central and regional levels and that the work helped remove confusion about Clean Development Mechanism-related issues. The documents produced are now “road maps” for Chinese Clean Development Mechanism project developers. Experts also gained experience in developing project development documents.

The Clean Development Mechanism component has laid the foundation for developing Clean Development Mechanism projects and other technology-related initiatives and potential technology transfer under the Clean Development Mechanism in two key areas – transportation and renewable energy. The Chinese team learned from Canadian experiences and examined institutional structures applicable.

## **5. General Success, Factors and Considerations**

Canada and China agree that the service provided by the Local Project Manager (LPM) was key to the success of the C5. The office ensured that the relationships between technical leads were built and sustained, and that the team was motivated. The Local Project Manager was essential to ensuring that information was transmitted and that appropriate tasks were completed.

The Director of NDRC, Ms. Sun Cuihua, indicated that it would have been better if there had been just one Canadian Executing Agency for C5 instead of two. Working with two separate agencies was sometimes difficult for the Chinese side.

It was indicated that China was pleased with the achievements of the C5 and the way in which the results had been brought together at the closing seminar. A strong foundation has been laid for future work on climate change in China and the Canada-China working group on climate change will provide an excellent vehicle to discuss future cooperative activities between the two countries.

## **6. Benefits to China and Canada**

The most significant benefits of C5 are an increased ability for China to address the issue of climate change (from emissions reductions through to adaptation), and improved abilities for Chinese organizations and individuals to make decisions and take action that include climate change considerations.

C5 has enabled China to be at the forefront of public awareness and adaptation. Stronger foundations have been laid on which climate change can be addressed more effectively, while gaining positive environmental, social and economic benefits.

New partnerships were developed, such as with the National Development and Reform Commission, which led to the signing of the *Canada-China Joint Statement on Strengthened Dialogue and Cooperation on Climate Change*. Existing agreements were reinforced such as those with State Environmental Protection Agency of China and the Chinese Meteorological Administration.

In addition, China has strengthened its knowledge in policy building and linkages to climate change and sustainable development, which greatly assisted in the development of the national strategy.

The C5 project also resulted in numerous benefits for Canada. For example, Environment Canada already had a well-established relationship with China, but the project has helped to foster trust and build on the department's relationship with the National Development and Reform Commission. The project has assisted Canada in meeting its UNFCCC objectives and improving its international position with respect to the major issues surrounding climate change and China. The *Canada-China Joint Statement* will continue to build on the foundation established by C5. Clean Development Mechanism projects can now be executed, and the training delivered on scenarios development will facilitate the transfer of Canadian climate-friendly technology and know-how to China.

Canadians have also gained experience in applying the regional climate modelling for impact studies, which in turn greatly promote the development of Canadian regional models, especially at Environment Canada's Meteorological Service of Canada. In addition, the creation of potential future commercial opportunities for Canadian business, while at the same time facilitating future Clean Development Mechanism activities (and thus the generation of carbon credits), will make it easier for Canadian business to interact with China.

The gender equity issue was also an important factor as it has helped Canada progress towards its goals of gender equality and sustainable development. Lastly, the C5 project has assisted Canada in becoming a global beneficiary resulting from China's increased effectiveness in addressing their greenhouse gas emissions.

These benefits will likely impact numerous Canadians directly such as researchers (better understanding of developing country considerations), businesses serving climate change needs (better able to market their products in China), and indirectly, such as Canadian citizens who will benefit from fewer climatic disruptions than would otherwise be the case.

## **7. Recommendations for the future**

In its evaluation report, the Pembina Institute suggested the transfer of capacity building to the Chinese provinces should continue, specifically through the components of Awareness and Outreach and Adaptation and Impacts.

In the short-term, Canadian International Development Agency has agreed to Environment Canada's request to extend C5 until the end of March 2005, with no additional budget. Two main activities will be delivered: an Awareness and Outreach workshop entitled *Building Regional Capacity for Climate Change A&O*, and an Adaptation and Impacts workshop entitled *Adaptation to Climate Change in Agriculture – Evaluation of Options*. There will also be vulnerability mapping on agriculture for one province (Ningxia) in western China, combining both the sensitivity and the adaptive capacity information. The National Communications component will also be using the extension to facilitate a practical attachment at Simon Fraser University.

With C5 leading to the development of the *Canada-China Joint Statement on Strengthened Dialogue and Cooperation on Climate Change*, Environment Canada's internal cooperation with China is assured. All C5 components were invited to participate in the development of its workplan. While all components will be important to the future activities of this agreement, the Awareness and Outreach component will be present throughout the work program. The next meeting of the working group of the Joint Statement will be held in China in the spring of 2005.

For the Clean Development Mechanism, future work will include the development of a Clean Development Mechanism policy framework for the Kyoto second commitment period, further assessment and case studies on carbon sinks Clean Development Mechanism project and other priority areas. Another important task will be finding an investor for the Beijing transport case study and taking the project to the Clean Development Mechanism Executive Board for approval.

## 8. Conclusion

China is now at the forefront of climate change adaptation because of C5. New domestic and international partnerships have been developed, and stronger foundations have been laid to address the issue of climate change more effectively, while gaining positive environmental, social and economic benefits. The success of the Awareness and Outreach Component is a prime example of how C5 helped build professional skills for women and men while getting the climate change message to the public, and youth in particular.

The C5 project also resulted in numerous benefits for Canada. Environment Canada's well-established relationship with China has been furthered with new trust and relationships. Canada's role in the project helps meet its UNFCCC objectives and improves its international position with respect to the major issues surrounding climate change and China.

These benefits will reach into the future as Canada's researchers have a better understanding of considerations for developing countries, as businesses serving climate change needs can better market their products, and indirectly as another country becomes more capable of addressing the global challenge of climate change.

## 9. References

The Delphi Group. 2001. *Climate Change in China*.