

**INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION
ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)**

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Contribution of Canada

to the CSTD 2016-17 priority theme on ‘The role of science, technology and innovation in
ensuring food security by 2030’

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Question 1

For Canada, development innovation can include new models, policy practices, technologies, and ways of delivering products and services that benefit and empower the poor in developing countries - any solution that has the potential to address an important development problem substantially more effectively than existing approaches. As such, our understanding of innovation goes beyond science and technology.

Based on the questions provided by the secretariat about our experiences with 'The role of science, technology and innovation in ensuring food security by 2030', we have provided (1) a more detailed example of a single project, followed by (2) a broader example of a range of projects.

(1) Canadian International Food Security Research Fund (CIFSRF)

How are the science, technology and innovation-related food security projects in your country or region resilient, sustainable, replicable, and/or scalable? Can you give any success stories or examples in this regard from your country or region?

Context : CIFSRF is a 9-year, 2-Phase initiative funded by Global Affairs Canada (GAC) and the International Development Research Centre (IDRC), and implemented by IDRC. It aims to increase environmentally sustainable food security (FS) for poor people, especially small-scale farmers and women, through applied, collaborative, results-oriented research that informs development practice. Phase 2 was designed to build on the research results and innovations of Phase 1, support more FS research in priority areas and scale up the most promising research results from Phases 1 and 2, to benefit subsistence farmers (particularly women) and contribute to global FS.

Project Description: The project intend to extend the results of phase 1 to other high value perishable fruits crops (banana, citrus and papaya) and new regions such as Africa (Kenya and Tanzania) and the Caribbean (Trinidad and Tobago). Phase 1 was focused on reducing post-harvest losses in mango in South Asia (India and Sri Lanka). The project aim to optimize the use of hexanal formulations and develop a packaging system s using nanotechnology. Training will be conducted for scientists and extension personnel in Kenya, Tanzania and Trinidad and Tobago to share the technology with growers and packers through fields demonstrations.

Location(s): India, Sri Lanka, Kenya, Tanzania and Trinidad and Tobago

Time period of implementation/starting data: December 2014 – April 2018

Main Actors :

- Tamil Nadu Agricultural University, (India)
- Industrial Technology Institute (Sri Lanka)
- University of Nairobi (Kenya)
- University of West Indies
- Sokoine University of Agriculture (Tanzania)
- Mysore Resettlement and Development Agency (MYRADA)
- University of Guelph (Canada)
- Global Affairs Canada

Target audience: Small-scale farmers, grower federations, packaging companies and government agencies.

Funders: International Development Research Centre and Global Affairs Canada through the Canadian International Food Security Research Fund

Technology and innovation used:

- Use of hexanal, an affordable and naturally occurring compound produced by all plants to slow the ripening of soft fruits and extends their storage life. The use hexanal spray has

increased fruit retention time by up to 2 weeks in mango and 5-7 days in peaches and nectarines.

- Smart packaging system: Using nanotechnology to develop hexanal impregnated packaging and coatings made from banana stems and other agriculture waste to keep fruit fresh.

Tools to disseminate technology and innovation (Role means dissemination of research to the target audience/knowledge transfer/participatory research/cooperative research, extension, trainings, field days);

Researchers are working with industry leaders to develop nine easy to use commercial products (hexanal sprays and dips for pre and post-harvest, wax coatings, etc.).

Issues addressed/focus related to food security (e.g. enhance yield, food quality, storage, transports, diversity of food):

Food storage: (Reduce post-harvest losses)

Goals and objectives related to food security:

Prevention of harvest losses increases the availability of nutrient rich fruits, improve economic returns for farmers, increase access to markets and create new economic opportunities for women engaged in post-harvest operation and processed fruits products.

Stage of implementation:

The project is currently in its second phase (scale-up), where the project is now looking to reach out to larger communities of small-scale farmers, and partnering with the private sectors to explore commercial applications. Patents are pending for an innovative technique that uses nanotechnology to extend and optimize the use of hexanal.

Is resilience or sustainability of the projects measured or evaluated? If yes, how?

At this stage, there is no resilience or sustainability of projects measured or evaluated.

Is information available (books, papers, internet, news)?

- Nanotechnology and soft fruit preservation product showcased at the “innovation marketplace”—a session on sustainable innovation and development held during the U.N. General

Assembly.<http://www.theepochtimes.com/n3/1835789-canadian-innovations-showcased-at-un/>

- Coverage by the Australian Broadcast Corporation:

<http://www.abc.net.au/news/2015-03-17/nanotechnology-mangoes-india-srilanka-canada/6325346>

- Coverage by CBC and information on the partnership with Harvest One. The licensing right of the product has been issued to Harvest One, a start-up company from Vancouver, British Columbia.

<http://www.cbc.ca/news/canada/kitchener-waterloo/guelph-fruit-spray-extends-shelf-life-1.3647271>

(2) Global Affairs Canada’s Food Security Agricultural Innovation sub sector focuses How are the science, technology and innovation-related food security projects in your country or region resilient, sustainable, replicable, and/or scalable? Can you give any success stories or examples in this regard from your country or region?

The Food Security Agricultural Innovation sub sector focuses on agricultural education and training, agricultural research, and livestock research in animal health. Total funding in FY 2014/15 was \$50.6

million. In FY 2014/15 there were 68 operational projects that included agricultural innovation activities.

Examples of our innovative and research-based agricultural and food security projects include: Nutritious Maize for Ethiopia: \$11.5 million, 2012-03-05 — 2017-09-29

This project aims to improve household food security and nutrition in Ethiopia for an estimated 3.98 million people by promoting widespread adoption of Quality Protein Maize (QPM) varieties amongst growers and consumers of maize. Farmers (28 percent women), researchers, extension agents, local and regional government officials, and media personnel learned about the nutritional benefits of quality protein maize and how to increase its productivity during 1,233 farmer-focused learning events. This project introduces new populations to a maize variety with a higher protein content in order to improve nutrition and productivity of participating farmers.

GEF Sixth Replenishment, Ag. Research component: \$11 million dispersed (total budget \$189 million) 2015-03-19 — 2018-06-30

As the only dedicated financial institution that addresses a broad range of threats to the global environment, the GEF provides financing for projects related to biodiversity, climate change, international waters, land degradation, sustainable forest management, the ozone layer and persistent organic pollutants. The GEF demonstrates significant capacity and potential to increase global environmental impacts, including through innovative and synergistic multi-focal area programming, while supporting national sustainable development priorities and local development co-benefits.

CGIAR Institutional Support 2016, Ag. Research component: \$9 million dispersed

CGIAR's mandate is to advance agri-food science and innovation for a world free of poverty, hunger, and environmental degradation. Project activities include: (1) developing agricultural practices, technologies and tools for increased productivity, dietary diversity and resilience to climate change and other shocks; 2) researching agricultural ecosystems and landscapes to reverse environmental degradation and enhance productivity in developing areas; and 3) developing policy evidence to improve the enabling institutional environment and performance of markets, and to enhance delivery of public goods and services

Support to Rice Research in Africa, \$6 million, 2011-03-25 — 2017-03-31

Supports local rice farmers, processors, and marketers in applying new technologies and techniques for producing quality rice products

Pan Africa Bean Research Alliance, Phase IV, Ag. Research component: \$0.68 million (total budget \$15 million), 2009-03-24 — 2015-01-31

PABRA focuses on improving bean crop production in order to increase the nutrition and food security of rural populations. PABRA supports improved nutrition, health, gender equality and food security in 28 African countries. PABRA breeds new bean varieties that are better able to “resist pests and diseases, survive in periods of drought, thrive in low fertile soils, provide bumper fields, contain more zinc and iron”, and as a result, are more valuable and provide a higher income to bean farmers.

Food Security and Environment Facility, \$15 million, 2008-09-16 — 2016-11-30

Results by 2016 included: increased awareness among farmers of environmentally sound agricultural practices for the improved production of maize, soybean, ground nut, onions, mangoes and cage fish farming; (2) increased crop yields for maize and soybean; (3) introduction of new practices such as dry-season gardening, drip irrigation and improved crop storage in communities with highly degraded lands; (4) 203 participants from 27 Ghanaian non-governmental and private sector organizations trained in financial and results-based management and gender equality; (5) 45,045 beneficiaries (25,710 women and 19,335 men) using the innovations and technologies introduced under the project.

A035574 - ASTI initiative/Tracking Agricultural, \$450,000 from GAC, 2012-2015

Results achieved end of the project: (1) the development of a data management portal for the Central American and Caribbean survey rounds, which allows country focal points to manage the survey process; (2) the creation of interactive online country pages featuring national agricultural research and development capacity, investment, and institutional indicators and trends; and (3) the establishment of the capacity to manage institutional data collection systems in countries through the development of its network of national focal points. This project used online platforms to facilitate information sharing and management. The data management portal for the Central American and Caribbean survey rounds enabled all parties to access the tool and facilitate the survey process.

Location(s): Developing countries in Africa, Asia, and Latin America, through our multilateral partners, including CGIAR, IFAD, FAO, in countries such as: Ethiopia, Uganda, Ghana, Tanzania, Kenya, Senegal, Vietnam, and Honduras.

Main Actors :

Global Affairs Canada implements projects both directly and as a donor agency through implementing partners, including:

CIMMYT – International Maize and Wheat Improvement Centre

GEF – Global Environment Facility

CGIAR - Consultative Group on International Agricultural Research

CIAT – International Center for Tropical Agriculture

Target audience: Small-scale farmers, grower federations, packaging companies and government agencies.

Funders: Global Affairs Canada, other donors

Technology and innovation used: Support to research capacity building and training, knowledge generation, dissemination, technology transfer, and the policy, planning, and management of research.

Tools to disseminate technology and innovation (Role means dissemination of research to the target audience/knowledge transfer/participatory research/cooperative research, extension, trainings, field days);

Field training, farm-focused learning events, integrated landscape management practices adopted by local communities, accelerated adoption of innovative technologies and management practices for greenhouse gas emission reduction and carbon sequestration

Issues addressed/focus related to food security (e.g. enhance yield, food quality, storage, transports, diversity of food):

Agroforestry, aquaculture, livestock vaccines, crop breeding, livestock husbandry, post-harvest, irrigation, soil fertility, pest management, food safety, and protection of genetic resources.

Goals and objectives related to food security:

The different activities of this sub-sector complete an agricultural research for development value chain, whereby education and training form the basis of knowledge generation for delivering and disseminating research results through educational and extension services to achieve improvements in agricultural practice at scale.

Stage of implementation: There are projects all at stages of implementation. The ones described here are operational as of the 2016/17 FY.

Is resilience or sustainability of the projects measured or evaluated? If yes, how?

Policy markers assign the amount of impact projects have in different sectors, for example “environmental sustainability”, “climate change adaptation”, and “Climate change mitigation”.

Is information available (books, papers, internet, news)?

- Agresults: <http://agresults.org/>

- CGIAR: <http://www.cgiar.org/>

- GEF: <https://www.thegef.org/>

Question 2 – we would suggest that Susan be contact person, serving as intermediary between CSTD and various internal resources in the Department. susan.hough@international.gc.ca

Question 3 – included in the body of question 1.