



## Joining forces to increase food security

**Research is boosting agricultural production, enhancing nutrition, broadening access to markets, and empowering women farmers.**

Canada is working with researchers and smallholder farmers in developing countries to reduce poverty by increasing access to sufficient, safe, and nutritious food. The **Canadian International Food Security Research Fund (CIFSRF)**, is a CA\$124 million joint initiative of Foreign Affairs, Trade and Development Canada and Canada's International Development Research Centre (IDRC).

CIFSRF brings together teams of Canadian and developing-country researchers to test practical means of supporting smallholder farmers' efforts to increase food production while improving nutrition. We are pleased to present emerging findings from the program's first five years. They provide a foundation as we move forward to take results and innovations to a wider scale of impact.

### Achieving results in Africa

**New vaccines against livestock diseases:** Pilot studies in sub-Saharan Africa show that a new vaccine to protect livestock from five major diseases is effective against lumpy skin disease, sheep pox, and goat pox. Researchers are now testing it against Rift Valley fever and *peste des petits ruminants*. This groundbreaking vaccine requires no refrigeration or boosters. In a second project, researchers are developing a vaccine to eradicate contagious bovine pleuropneumonia. Used with better disease surveillance, these vaccines will reduce livestock losses that cost Africans millions of dollars annually.

**Higher yields, more efficient water use:** In Africa's Sahel region, farmers working with researchers combined fertilizer "micro-dosing" with improved rainwater harvesting techniques to boost yields of cereal and legume crops. These innovations substantially increased productivity and farmers' income. In Burkina Faso, sorghum yields more than doubled to about 700 kg per hectare. Quick to adopt the technologies, women farmers reported average income increases of 200–380%.

### Collaborative research on food security

**97,000**  
men and women farmers

**251**  
postgraduate  
students



**37**  
consortia  
partners

All numbers as of August 2014

### Higher income, better diets from raising goats and sheep:

In Tanzania, the introduction of two new breeds of dairy goats into semi-arid regions has increased farmers' income and household milk consumption. The simultaneous introduction of improved cassava and sweet potato varieties has provided an important extra source of feed for the goats and food for the project's farming families. In Mali, research also identified three readily available tree-fodder species that fattened sheep 15% more efficiently than regularly used groundnut stems and leaves, and at a fraction of the cost.

**Better soils, crops, and nutrition:** In southern Ethiopia, improved chickpea varieties now provide up to 25% of farmers' income and have exceeded yields of local varieties by 60–90%. Plant breeding and better soil management—including the application of zinc fertilizer—produced nutrient-rich grains with increased zinc and iron content. These more nutritious crops, combined with nutrition education, have already helped to increase children's weight gain, a key indicator of nutrition. Local institutions joined forces to produce more seeds of the improved varieties and will distribute them to 30,000 farmers in the coming years.

**Wild vegetables tamed for food and income:** Nigerian vegetable growers have almost doubled their income by cultivating underutilized indigenous vegetables such as local celery, eggplant, and amaranth that are highly nutritious. The farmers, half of whom are women, gained new skills in good agronomic and post-harvest practices and marketing, and formed 22 cooperatives to access credit, training, and government support. Household dietary diversity has improved, and supply and demand for the vegetables has already significantly increased.

**Farmers adopting innovations on a large scale:** In Kenya, research is making existing agricultural innovations work for farmers in semi-arid lands and helping them to improve productivity and access markets. For example, farmers are adopting improved varieties of high-value traditional green-grains and cowpeas and finding buyers under a contract with a Kenyan company to produce certified seeds for these varieties; they have sold 8,305 kg thus far. The project builds on existing farmer networks and their ability to choose and share farming techniques; it has already reached more than 5,000 farmers.

## Achieving results in Asia

**Protecting fruit, increasing income:** Researchers in Canada, India, and Sri Lanka have developed a simple and eco-friendly technology to reduce post-harvest losses in perishable fruit. Spraying with a naturally occurring compound, hexanal, delays ripening and keeps mangoes on the tree for up to one month longer. Delaying harvest helped farmers earn up to 15% more money by selling fruit when most other producers' supplies were exhausted. Using nanotechnology, researchers are introducing the compound into cartons, wrappers, and other packaging, to increase storage life. The technology could benefit soft-fruit farmers the world over.

**Fish on farms improve nutrition:** In Cambodia, researchers are adding essential nutrients to deficient diets by introducing an aquaculture component to homestead fruit and vegetable production. Three hundred families are raising small nutrient-rich fish for home consumption in the same ponds as large fish, which can also be sold for income. The monthly income of families with fish ponds and home gardens has increased by 15–30%. The Cambodian government is using the research findings to inform its "one fish pond per poor family" program.

**Boosting the value of nutritious millets:** Researchers in Canada and India have built an easy-to-use and affordable grain mill that reduces women's work while tripling the value of small millets, hardy and highly nutritious grains that already fetch a higher price than rice or wheat. Orders to buy the mill are coming in from across India and buyers in Uganda, Zimbabwe, and elsewhere have expressed interest. Women entrepreneurs have begun to make and sell millet-based snacks, baked goods, and drinks.

## Achieving results in Latin America and the Caribbean

**Adding value to local fisheries:** In the northern Bolivian Amazon, research has helped improve household income derived from fish sales. Better hygiene protocols and aquatic resource management and the opening of the first community-led fish meat processing plant improved the entire fish production chain. Growing sales outside the region are increasing access to protein and important vitamins and minerals in other parts of Bolivia. The research prompted the local government to recognize indigenous communities' rights to engage in commercial fisheries.

**Hardier, more nutritious potatoes:** In Colombia, researchers have developed new potato cultivars that are highly resistant to late blight disease, combining the best modern technologies and participatory methods. Research demonstrated that some of these cultivars contain twice the amount of protein, are higher in iron and zinc than existing local potatoes, and yield up to 30% more. Three of the cultivars were selected by indigenous farmers, who are now multiplying them.

## Bringing results to scale

These first-phase results from CIFSRF research show great promise for improving the lives and livelihoods of the poor well beyond the project sites and communities. Finding the best way to scale them up is the main goal of CIFSRF's second phase: to bring research results to directly benefit a larger number of vulnerable smallholder farmers around the world.

Announced by Canadian Prime Minister Stephen Harper, in October 2011, CIFSRF's second phase harnesses the best of the private, public, and not-for-profit sectors to expand the research portfolio.

For more information on CIFSRF's second phase, visit our website: [www.idrc.ca/cifsr](http://www.idrc.ca/cifsr).

PHOTOS: IDRC/BARTAY; IDRC/PANOS PETTERIK WIGGERS

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