

# SCALING UP SMALL MILLET POST-HARVEST AND NUTRITIOUS FOOD PRODUCTS

FEMALE-FRIENDLY EQUIPMENT AND VALUE CHAIN SOLUTIONS DRIVE PRODUCTION AND CONSUMPTION OF HEALTHY MILLETS IN INDIA

## WHAT INDIAN AND CANADIAN COLLABORATORS DISCOVERED:

- Proven business models for scaling up the production and consumption of underutilized healthy crops like small millets
- Increased the capacity of equipment manufacturers to meet varying hulling/processing equipment requirements at the village, small and medium enterprise, and microenterprise levels
- Improved designs of small millet processing equipment for ease of operation and safety for women
- Best practices and advice to assist policymakers in increasing the availability and consumption of small millets

## BY THE NUMBERS

- 6 equipment manufacturers supplied 173 small millet processing units to 54 districts in 10 states; an additional 19 units were revived
- Approximately 1,015 tonnes of millet rice and grits have been produced with the new and revived units, reaching 288,500 consumers across 10 states
- Produced 210 tonnes of value-added food products, reaching 278,000 additional consumers
- Increased the capacity of end users to operate processing equipment: 33 village level processors, 25 small scale processors, 3 medium scale processors, 7 Farmer Producer Organizations (FPOs), 3 food companies, 198 prospective buyers, and 62 promoters
- Increased the capacity of 66 food enterprises, 152 Pushcart Millet Porridge Vendors (PMPVs), 4 FPOs and 15 non-governmental organizations to expand their market for ready-to-eat small millet products; 30 of the food enterprises increased sales by more than 15% and 8 expanded sales outside the state
- PMPVs, often poor entrepreneurs (mostly women) who primarily serve poor areas, are selling hygienic millet porridge and other millet products to about 17,610 persons each day
- Increased the capacity of 72 women organizations to promote the reach of small millet food products among their members; about 130 tonnes of small millet rice were supplied by women organizations to their members, who tend to be lower middle class or low-income
- 829 persons (725 women) in 85 locations (20 urban, 49 rural, 7 tribal) participated in workshops on how to organize recipe demonstrations
- 15,838 persons (12,993 women, 1,719 men, 1,126 children) participated in recipe demonstrations in 334 locations
- 72,490 persons, mainly women, farmers and school children, were educated about the health benefits of small millets through 84 local and district-level promotional events and 21 exhibitions
- More than 200,000 people learned about the value of small millets through programs aired on community radio, local TV, and text audio messages

## THE IMPACT:



Global Affairs  
Canada

Affaires mondiales  
Canada



IDRC | CRDI

International Development Research Centre  
Centre de recherches pour le développement international

Canada

The technologies, market supports and policy tools have been developed to bring back neglected millets in countries across South Asia and Africa. Companies that manufacture women-friendly dehulling equipment have four types of machines to better meet local and regional needs. Women's groups and other small enterprises (e.g., family-owned pushcart millet porridge vendors) are producing and selling ready-to-eat millet products that consumers want. Public acceptance of millet foods is also increasing. As well, policymakers have the evidence to increase the awareness, availability, and consumption of small millets.

## THE CHALLENGE:

A lack of dietary diversity has contributed to malnutrition and a prevalence of obesity-related diseases such as diabetes in many South Asian countries, including India. One solution is small millets, a gluten-free "superfood" that is also climate resilient. However, both the production and consumption of small millets is low, mainly due to a weak supply chain, poor consumer awareness, poor yields, inadequate or inefficient processing facilities, and policy neglect when compared to crops such as rice. High drudgery in manual processing of small millets has contributed to the fast decline in their consumption in regions where millets are produced. Two previous IDRC-supported projects developed standardized small millet processing machines for different market sizes and appealing millet food products. Translating these innovations into sustained change required overcoming failings in the value chain and supportive government policies.

## TRANSLATING RESEARCH INTO ACTION

### Scaling up the reach of small millet dehulling and processing equipment

*Project participant Sahul Hameed, the proprietor of Century Foods in Tamil Nadu, adopted new equipment and practices (e.g., food safety, better packaging, barcoding), and new products that increased his sales of small millet-based foods from 1,200 kg/year to 12,000 kg/year.*

- Developed more efficient and user-friendly equipment for de-hulling and processing small millets, which has increased production and reduced women's drudgery
- Two business models significantly increased equipment manufacturers' capacity to produce and sell more dehulling machines, paving the way for the development of decentralized small millet processing infrastructure in Eastern and Central India:
  - An on-site incubation model that supported manufacturers through product improvements, marketing, and links to potential buyers
  - A knowledge transfer business model to facilitate adoption of processing technology, notably the revival of 19 processing units that were defunct or operating sub-optimally.
- Demonstrations promoted the processing equipment to prospective buyers at 20 locations in India, and 10 national and international events.
- 4 FPOs, comprising 1,629 farmers, established a processing unit and begun supplying seeds to farmers, which has shortened the value chain between FPOs and consumer groups, built business linkages and reduced consumer prices. During the project they conducted CAD\$88,826 worth of transactions.

### Improving the availability, choice, and consumption of small millets

*M. Desinguraja, a Pushcart Millet Porridge Vendor in Sathyasai Nagar, Krishnagiri, who participated in a training session for these informal street food vendors, says his customers appreciate his initiatives to improve her business' hygiene and cleanliness.*

- Two business models scaled up the availability of small millet food products:
  - An on-site incubation model for supporting micro, small and medium enterprises and customized capacity building of cottage enterprises and FPOs
  - A working model for promoting the consumption of small millets, mainly through individuals, consumer organizations and food service providers. Customized on-site incubation support included skill building through recipe demonstration and cooking workshop and capacity building of consumer organizations in rural and urban areas.
- Demonstrated storage practices (e.g. hermetic) that increased the shelf life of dehulled small millets
- A working model for supporting PMPVs can be extended to other regions, based on improving their infrastructure and image, adopting best practices, diversifying products, and registering with the city and India's Food Safety and Standards Authority to legitimize their profession.
- Awareness of the health benefits of consuming small millets was promoted to more than 200,000 consumers through mobile text messages, community radio programs at 34 radio stations, short films on recipes, awareness posters, and a music album of motivational songs.
- Improved the capacities of 798 social workers (695 women and 103 men) from 85 locations (49 rural, 29 urban and 7 tribal) related to the health benefits of small millets and recipe demonstrations.

### **Supportive policies to strengthen the value chain and increase consumption of small millets**

*“We are trying to ensure millets are brought under the PDS (Public Distribution System) and schemes like Midday Meal (school meal program). The (National Institution for Transforming India) has suggested this should be part of the PDS.”*

**Shobhana K Pattanayak, Agriculture Secretary**

- 3 policy briefs were developed, aimed at informing decisions related to establishing decentralized processing infrastructure, establishing micro, small and medium enterprises and cottage industries in the millet sector, and addressing supply chain constraints
- Other policy support included:
  - The need for technology transfer organizations, incubators offering on-site support, common service centres for packaging, and nutritional analysis
  - Scaling up operations of equipment manufacturers
  - Increasing the consumption of small millets and strengthening the roles of women, farming communities, and marginalized communities in emerging millet value chains
  - Product standards and regulations

### **WHAT'S NEXT?**

The project has boosted awareness of the importance of small millets among consumers, producers, and policymakers. Pilots have begun to introduce small millets in public food programs in India, and there are opportunities to scale up South India's proven models with Central, Eastern and Northern India, as well as other south Asian countries (Nepal, Sri Lanka), and Africa (Zimbabwe, Kenya, Malawi). The DHAN Foundation has launched a pan-Indian initiative – the Small Millet Foundation – to scale up technologies and practices and to ensure institutional continuity of these partnerships and working relationships. There would be value in expanding the public policy focus from mainly production and productivity to include: production, availability of processing units, marketing small millets, manufacturing value-added products, and increasing consumer demand. Project partners are also exploring applying lessons learned from the project to other neglected pulses and oilseeds.

## LEARN MORE ABOUT THIS PROJECT:

### Project details:

<https://www.idrc.ca/en/project/scaling-small-millet-post-harvest-and-nutritious-food-products-cifsrf-phase-2>

**Project website:** [www.dhan.org/smallmillets2/index.html](http://www.dhan.org/smallmillets2/index.html)

## KEY OUTPUTS

### ACADEMIC PAPERS

*Helping Agribusinesses—Small Millets Value Chain—To Grow in India* Ademola Adekunle, Darwin Lyew, Valérie Orsat and Vijaya Raghavan. *Agriculture* 2018, 8(3), 44; doi:10.3390/agriculture8030044

*National seminar on Emerging Trends in Processing & Value Addition of Small Millets, Madurai, India* (2017)  
<http://www.dhan.org/smallmillets2/file/Abstract.pdf>

### OTHER

*Awareness posters on small millets: English* Muniappan, Karthikeyan <https://idl-bnc-idrc.dspacedirect.org/handle/10625/57047>

*Country report : scaling up small millet post-harvest and nutritious food products in India.* Keats, Sharada; Jeyaranjan, J. (2018-06) <https://idl-bnc-idrc.dspacedirect.org/handle/10625/57262>

*Details of new products developed by food enterprises.* DHAN Foundation (2018) <http://hdl.handle.net/10625/57038>

*Guidelines for Setting Up A Small Millet Processing Unit* Small Millet Foundation and DHAN Foundation.  
<https://www.dhan.org/smallmillets2/file/guidelines-sm.pdf>

*Masters' Thesis: Development of a millet dehuller (hand-operated) to reduce drudgery in processing and utilization of millet waste (hulls) in antioxidant extraction.* Subhash Palaniswamy. (2018)  
[http://digitool.library.mcgill.ca/webclient/StreamGate?folder\\_id=0&dvs=1543437331135~220](http://digitool.library.mcgill.ca/webclient/StreamGate?folder_id=0&dvs=1543437331135~220)

*Multi-millet based instant therapeutic foods.* Post Harvest Technology Centre, Agricultural Engineering College And Research Institute, Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu, India. (2017)  
<https://www.dhan.org/smallmillets2/file/Multi%20Millet%20Based%20Instant%20Therapeutic%20Foods.pdf>

*Thoroughly modern millets DNA News* <https://www.dnaindia.com/lifestyle/report-thoroughly-modern-millets-2551181>

### POLICY BRIEFS

*National policy workshop on mainstreaming small millets in our diets : synthesis of recommendations.* DHAN Foundation (2018) <http://hdl.handle.net/10625/57051>

*Small millets in mainstream diets: promoting decentralised processing infrastructure.* Karthikeyan, M. (2016)  
<http://hdl.handle.net/10625/57318>

## VIDEO

*Audio-visual on Community scale small millet processing unit.* (2017) <http://www.dhan.org/smallmillets2/sm-audio-video.html>

*Short films on cooking demos of 28 small millet recipes in Telugu* (2016) DHAN Foundation, Small Millet Foundation <http://www.dhan.org/smallmillets2/sm-recipes-videos-tamil.html>

VIEW ALL RELATED PROJECT OUTPUTS IN THE IDRC DIGITAL LIBRARY.

<https://idl-bnc-idrc.dspacedirect.org/browse?type=project&value=108128>

## QUICK FACTS

Project location(s): India

Institutions: McGill University (Canada); Development of Humane Action (DHAN) (India)

Project duration: December 15, 2015—April 16, 2018

Project budget: CA\$ 1,477,540

Project number: 108128

THE CANADIAN INTERNATIONAL FOOD SECURITY RESEARCH FUND IS JOINTLY FUNDED BY GLOBAL AFFAIRS CANADA AND THE INTERNATIONAL DEVELOPMENT RESEARCH CENTRE.