



### A long-standing alliance

Since the 1960s, CIMMYT and Nepal have been collaborating on agricultural development and research. In 1985, CIMMYT signed an MOU with the Government of Nepal to formalize the partnership. New wheat varieties, first introduced to Nepal by Nobel laureate and CIMMYT wheat scientist Norman Borlaug, and collaborative research, over years, on wheat and maize have raised productivity in the Terai region and the hills of Nepal.

Women farmers with hybrid maize in Kailali, Dhangadi, Nepal. Photo: Darbin Joshi, CIMMYT.

### At a glance

- Agriculture is the single largest economic sector in Nepal, providing livelihoods for two-thirds of the population
- Since 1985, CIMMYT has been a valued partner of Nepal leading to many successes in agricultural development
- Areas of collaboration include improving crops and cropping systems to increase sustainability and resilience; domestic seed systems; balanced soil fertility management; market development of target crops; scaling of agricultural innovations; digital agriculture and more
- In December 2023, a 10-year collaboration MOU was signed between CIMMYT and NARC to bolster agricultural productivity and tackle agricultural challenges through innovative research and development

### Key collaborations

#### Maize and wheat germplasm development and

**deployment:** CIMMYT works closely with the Nepal Agricultural Research Council (NARC), Seed Quality Control Centre (SQCC) and private seed companies, to promote the local production and marketing of hybrid and improved varieties of maize and wheat seeds in Nepal.

Between 2010-2022, NARC released 17 new maize varieties including six hybrids and 22 high-yielding wheat varieties using germplasm sourced from CIMMYT. These maize and wheat varieties are climate resilient, stress tolerant, and have enhanced nutritional qualities. Collaborative efforts have increased national maize production by 43% while wheat production increased by 78%. The local hybrid maize seed production volume increased from 4 metric tons (t) in 2018 to nearly 100 t in 2023. CIMMYT, in collaboration with partners enables the government to realize the targets of the National Seed Vision (2013-2025).

**Crop and system productivity:**

CIMMYT adopts a systems approach when working to address agronomic concerns such as water management, weed control, fertilizer management, crop establishment, and tillage through 'Best Management Practices' (BMP) packages. In 2023, more than 10,000 farmers applied BMPs for maize and wheat production. CIMMYT's work has led to adoption of mung bean in rice-wheat cropping systems leading to improved rice productivity. with reduced nitrogen application. Joint research by CIMMYT and NARC led to the launch of new fertilizer recommendations for rice, wheat and maize - the first revision after 47 years. CIMMYT also works closely with NARC on management of pests such as fall army worm (in maize) and diseases such as rust and blight (in wheat), and stem blight (in lentil).

**Resilient maize-based livelihoods:**

CIMMYT supports the maize commercial model to promote local seed varieties for maize grain production and improve self-reliance in maize. In 2023, CIMMYT commercial maize production pilot project supported 4,315 households by producing 5,046 t of spring maize grain worth USD 1.26 million on 828 ha. CIMMYT-trained farmers produced an average yield of 6.1 t/ha across six districts, which is double the national average of 3.15 t/ha.

Improved market information and linkages led farmers to receive an average price of NPR 30/ kg for their maize grain, which was 50% more than the equivalent 2020 price. On average, these farmers earned USD 267 from their maize crop. In 2023, 60 small and medium-sized enterprises (MSMEs) involved in the maize value chain were supported with equipment and materials worth USD 161 million of which 45% was contributed by MSMEs themselves.

**Digital agriculture:** In 2020, CIMMYT and SQCC launched a digital seed information system DESIS to help aggregate information about early-generation seeds available in-country and share it with stakeholders in near-real time. In 2021, CIMMYT and NARC developed and launched the digital soil map of Nepal (<https://soil.narc.gov.np>) to drive the development of market-led fertilizer products, aid fertilizer procurement and distribution, and inform and update soil management recommendations. CIMMYT is collaborating with the Ground Water Resources Development Board to develop a groundwater digital monitoring system. Since 2019, CIMMYT and partners have been working with NARC to implement advanced wheat disease forecasting, early warning systems, and disseminating timely advisory to farmers.

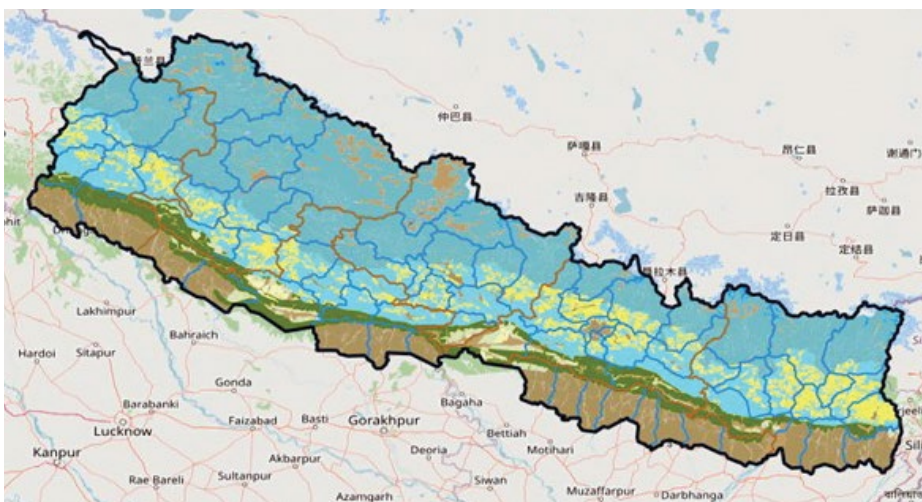
**Climate Change:** CIMMYT's research portfolio on germplasm and seed systems, tillage and crop management, and monitoring and forecasting can all contribute to climate adaptation, and in some cases mitigation, through gains in production and/or reductions in risk. The wheat yield in the Terai region is significantly reduced by high temperatures during flowering and grain-filling. CIMMYT has shown that early planting of wheat through minimum or zero-tillage, along with BMPs, limits yield losses. CIMMYT also produces heat and drought tolerant wheat and maize varieties. It engages with digital service providers and agri-tech companies to provide timely and real time advisories to farmers which can help them plan and respond to climate changes.

**Scale-appropriate mechanization:**

In the mid-hill region, over 20,000 mini tillers have been adopted by farmers, including women. In the Terai region, the number of reapers in use has increased from 14 in 2014 to more than 3,500 in 2023. CIMMYT and its partners also promote the adoption of seed drills, two-wheel tractors, combine harvesters and threshers and provide training on their use and maintenance. CIMMYT works closely with the private sector, the Nepal Agricultural Machinery Entrepreneurs' Association (NAMEA), and the public sector to create and support local machinery service provision.

**Capacity development and private sector engagement:**

More than 200 researchers and senior officials from Nepal have benefited from scientific trainings, visits, and study fellowships. Each year, CIMMYT trains between 8,000-10,000 farmers and market actors on good agricultural practices and



High-resolution digital soil map for Nepal developed by CIMMYT and NARC.

agribusiness. CIMMYT has also helped build the capacity of local seed and fertilizer entrepreneurs, small mechanization service providers, seed companies, local traders, grain processors, feed mills and farmers cooperatives, NARC and the SQCC. CIMMYT is working with more than 100 agribusiness MSMEs to support their business development.

#### **Gender and social inclusion:**

CIMMYT trains women to enable them to own and operate small machinery. CIMMYT has guided policies and lending practices for banks, enabling more women to purchase agricultural machinery and form small businesses. In 2018-2023, about 13,051 farmers, of which 5,233 were women, have gained affordable access to and benefited from scale-appropriate machinery.

In 2022-23, women farmers comprised 52% of all soil fertility and seed production trainees. About half of the farmer recipients of the 2,357 soil health cards were women farmers. In 2022-23, over 12,000 farmers received improved seed from CIMMYT, among them 53% were from disadvantaged groups and 45% were women. Forty of the 50 locally recruited agriculture technicians in 50 partner cooperatives were women. Out of 42,859 MSMEs and farmers reached by CIMMYT and partners between 2021 and 2023, 43% were women. About 11,000 women members from cooperatives have benefitted from seed production, integrated soil fertility management and commercial maize production.

**Advocacy for agricultural policies:** CIMMYT promotes public-private partnerships to fast-track varietal and hybrid registration and exclusive licensing to private companies. It supported the development of hybrid seed production and certification guidelines - a first for Nepal, and endorsed by the government. CIMMYT works closely with the Ministry of Agriculture and Livestock Development to create policy guidelines for producing and promoting balanced soil fertility management in Nepal. CIMMYT's work in commercial maize production led to support of USD 3.7 million from the Government of Nepal. CIMMYT also works with provincial governments through its 'Roadmaps' project to identify changes for increasing adoption and impact.



Women using a mini-tiller for direct seeding in Ramghat, Surkhet in Nepal. Photo: P. Lowe, CIMMYT.

## Projects

- Nepal Seed and Fertilizer (NSAF) project
- Cereal Systems Initiative for South Asia (CSISA)
- Disease Early Warning Advisory System (DEWAS)
- Transforming Smallholder Food Systems in the Eastern Gangetic Plains project (RUPANTAR)
- Sustainable Intensification of Mixed Farming Systems (SI-MFS)
- Transforming Agrifood Systems in South Asia (TAFSSA)
- Seed Equal Initiative
- Accelerated Genetic Gain (AGG) in Wheat
- Mainstreaming zinc in wheat varieties for improved nutrition
- Biological Nitrogen Inhibition (BNI) wheat for improved nitrogen use efficiency

## About CIMMYT

*CIMMYT is a cutting edge, non-profit, international organization dedicated to solving tomorrow's problems today. It is entrusted with fostering improved quantity, quality, and dependability of production systems and basic cereals such as maize, wheat, triticale, sorghum, millets, and associated crops through applied agricultural science, particularly in the Global South, by building strong partnerships.*

*CIMMYT is a core CGIAR Research Center, a global research partnership for a food-secure future, dedicated to reducing poverty, enhancing food and nutrition security and improving natural resources.*

## Partners and funders:

- Ministry of Agriculture and Livestock Development (MoALD) and Department of Agriculture (DoA)
- Nepal Agricultural Research Council (NARC)
- Prime Minister Agriculture Modernization Project (PMAMP)
- Provincial Governments, including Agriculture Knowledge Centers (AKCs)
- Seed Quality Control Center (SQCC)
- Plant Quarantine and Pesticide Management Center (PQPMC)
- Seed Entrepreneurs' Association of Nepal (SEAN)
- Nepal Fertilizer Association (NeFEA)
- Nepal Agricultural Machinery Entrepreneurs' Association (NAMEA)
- Agricultural universities
- CGIAR Centers
- International Development Enterprises
- CBOs/NGOs/INGOs
- United States Agency for International Development
- Bill & Melinda Gates Foundation
- Australian Centre for International Agricultural Research (ACIAR)
- Japan International Research Center for Agricultural Sciences (JIRCAS)
- CGIAR Research Initiatives



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