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REPORT

# CGIAR 10 YEAR IMPACT IN NEPAL

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We also recognize the continued support and collaboration of national and regional partners, whose engagement ensures that the solutions developed are responsive to local needs, strengthen innovation systems, and contribute to building more resilient agrifood systems.

### About CGIAR Scaling for Impact (S4I) Program

Scaling for Impact (S4I) is a CGIAR program (2025–2030) that tests, refines, and scales innovations in food, land, and water systems. It works to align those innovations with stakeholder needs to achieve transformative impact.

Website: <https://www.cgiar.org/cgiar-research-portfolio-2025-2030/scaling-for-impact/>

### About CGIAR

CGIAR is a global research partnership for a food secure future. Visit <https://www.cgiar.org/research/cgiar-portfolio> to learn more about the initiatives in the CGIAR research portfolio.



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# Acronyms

**ABC** – Alliance of Bioversity International and CIAT

**AKC** – Agriculture Knowledge Center

**CIMMYT** – International Maize and Wheat Improvement Center

**CORDEX**– Coordinated Regional Climate Downscaling Experiment

**DLS** – Department of Livestock Services

**DoA** – Department of Agriculture

**DWRI** – Department of Water Resources and Irrigation

**ICIMOD** – International Centre for Integrated Mountain Development

**IFPRI** – International Food Policy Research Institute

**ILRI** – International Livestock Research Institute

**IRRI** – International Rice Research Institute

**IWMI** – International Water Management Institute

**MoALD** – Ministry of Agriculture and Livestock Development

**MoEWRI** - Ministry of Energy, Water Resources and Irrigation

**NARC** – Nepal Agriculture Research Council

**SME** – Small and Medium Enterprises

**WEFE** – Water Energy Food and Environment

**WRERC** – Water Resources and Energy Research Center

## CGIAR Introduction

Established in 1971, the CGIAR is a global research partnership focused on ending hunger, reducing poverty, and improving nutrition, health, and the sustainability of natural resources. CGIAR’s mission is to deliver science and innovation that transforms food, land, and water systems in the face of climate change. The CGIAR Centers operate in six global regions through 15 international research centers (see headquarters and regional offices of each center in Figure 1).

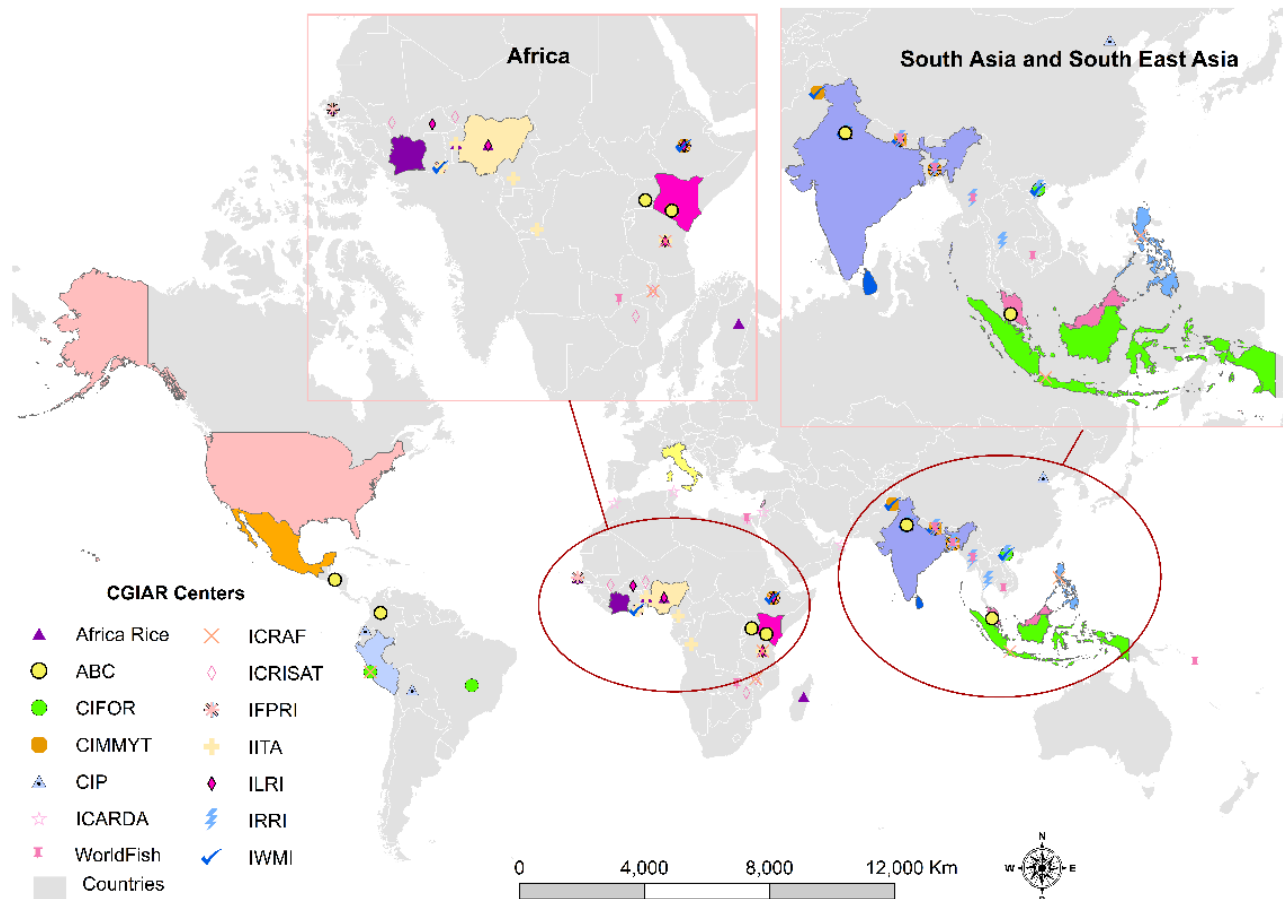


Figure 1. Globally located CGIAR Centers and Headquarters (shaded color) (Source: Authors' creation)

## CGIAR Global Impact Area

CGIAR works to help meet the global targets laid out in the Sustainable Development Goals with an emphasis on five areas of impact (Figure 2):



**CLIMATE  
ADAPTATION &  
MITIGATION**



**ENVIRONMENTAL  
HEALTH &  
BIODIVERSITY**



**GENDER EQUALITY,  
YOUTH & SOCIAL  
INCLUSION**



**NUTRITION,  
HEALTH & FOOD  
SECURITY**



**POVERTY  
REDUCTION,  
LIVELIHOODS &  
JOBS**

Figure 2. CGIAR’s five targeted impact areas to advance the Sustainable Development Goals (Source: CGIAR)

## CGIAR Centers in Nepal

The CGIAR Centers (Figure 3) in Nepal work closely with the three tiers of government, private-sector actors, regional strategic partners, civil society organizations, research and academic institutions, farmers and their organizations, cooperatives, agri-business firms, and development partners to advance economic growth, food security, environmental sustainability, climate resilience, and inclusive development. Through research and innovations in agriculture, water and natural resources management, the CGIAR supports Nepal's broader agenda for sustainable, resilient and inclusive agri-food systems transformation.

The Centers contribute to cutting-edge research and innovations in agriculture, agricultural water management, irrigation as a service, water-energy-food-environment (WEFE) nexus solutions, water and natural resources management, climate resilience, agrobiodiversity, livestock productivity, rice systems, gender and social inclusive approaches to achieve five impact areas. They deliver technologies and approaches, transfer technical know-how, and support evidence-based policy processes and implementation across diverse farming systems.

The **International Rice Research Institute (IRRI)** was the first CGIAR Center that started its work in Nepal in 1966. IRRI supports the development and dissemination of improved rice varieties, climate-smart agronomy practices, and strengthened rice seed value chains.

The **International Maize and Wheat Improvement Center (CIMMYT)** began working in Nepal in 1985. CIMMYT leads research on stress-tolerant maize and wheat, sustainable intensification, sustainable agrifood system models with public, private, and community partnership, and seed-system strengthening across the Terai and mid-hills.

The **International Water Management Institute (IWMI)** has partnered with the Government of Nepal (GoN) since 1986. IWMI develops, tests, and scales science-based water management solutions and decision-support systems to inform policy and investment for climate-resilient and inclusive development. Its work spans surface and groundwater management for agri-food systems transformation; solar-powered irrigation and multiple-use water systems using socio-technical bundling; water-smart agricultural innovations; irrigation modernization; transformative water governance; gender and social inclusion; water-risk and vulnerability assessments and nature-based solutions; the water-energy-food-ecosystem nexus; and scaling climate-resilient, inclusive, and locally led water solutions.

The **Alliance of Bioversity International and CIAT (ABC)** contributes to biodiversity conservation, nutrition-sensitive agriculture, and the development of climate-resilient agricultural value chains.

The **International Livestock Research Institute (ILRI)** established its partnership with the GoN in 2019. ILRI focuses on developing and scaling sustainable livestock systems to optimize livestock's contribution to poverty reduction and food and nutrition security, while also reducing public-health risks through improved food safety, zoonotic-disease control, and lowering the sector's environmental footprint.

The **Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF)** has been working in Nepal since 2014 to address development challenges through sustainable agriculture, forestry, and agroforestry. CIFOR-ICRAF formalized its partnership with the GoN in 2024 through a Memorandum of Understanding.

The **International Food Policy Research Institute (IFPRI)** supports Nepal in achieving inclusive economic growth and enhanced food security through evidence-based policy reforms in agriculture, agribusiness, and agricultural trade.

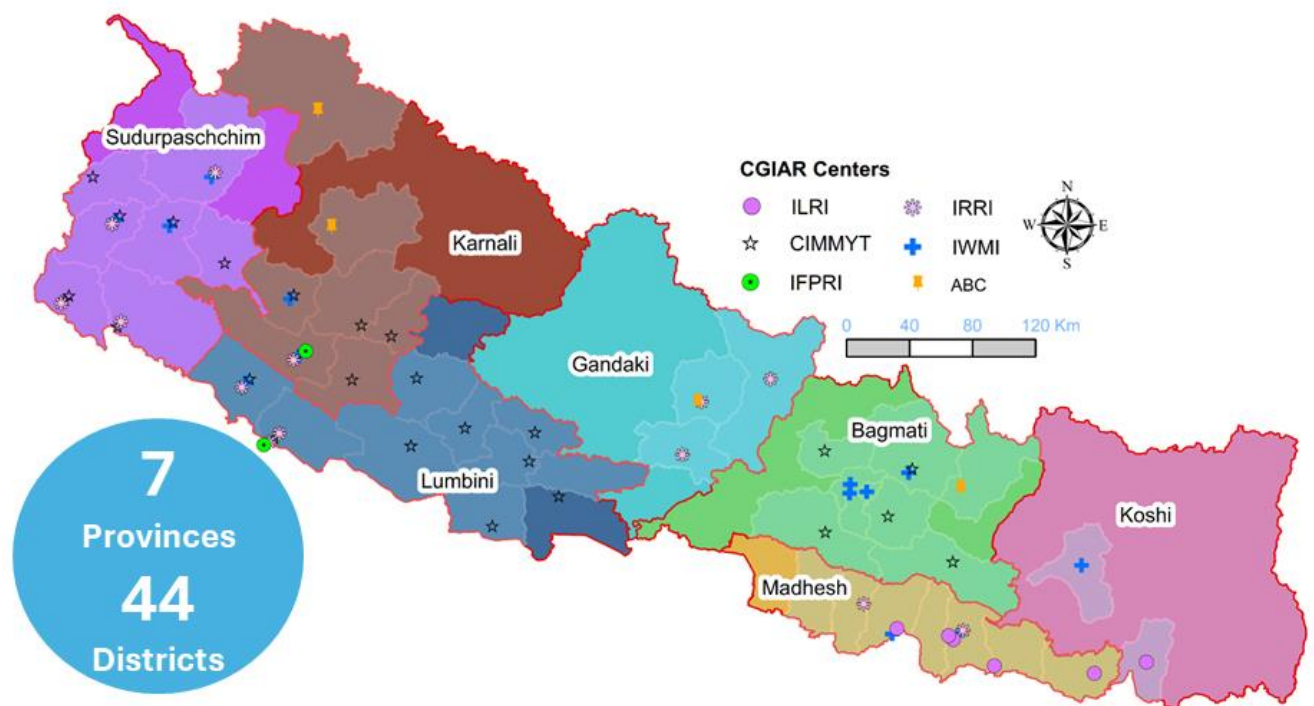


Figure 3. Working provinces and districts of the CGIAR Centers working in Nepal (Source: Authors' creation)

## CGIAR 10 Year Impact in Nepal

In the last ten years, CGIAR's research and innovations have helped Nepal's farmers, communities, and waterscapes adapt to climate shocks, boosting agricultural productivity, strengthening water security, and transforming livelihoods across the country.

The CGIAR Centers' impact over 10 years is summarized as:

### 1. Innovations This sub-section describes the innovative tools, methods, and practices of the CGIAR Centers in Nepal over the period of past 10 years

- **Scale appropriate agri-mechanization & irrigation:** Localized 2 wheel/4 wheel seeders and threshers; market-led service provision models; low cost irrigation; laser land leveling and zero tillage for cereal systems.
- **Cropping system intensification:** Lentil and mungbean into rice-wheat systems; climate-smart wheat management to reduce terminal heat risk; precision nutrient management packages.
- **Crop livestock integration:** Improving the feed quality of major crop residues such as rice straw and maize stover achieved through dual purpose crop improvement and physical, chemical and biological processing resulted in improving productivity of dairy animals.
- **Smart irrigation toolkits & on farm diagnostics:** Practical, low cost toolkit combining rainfall/groundwater/surface water monitoring, pump and conveyance testing, and field application assessments for efficiency gains.
- **Irrigation modernization and agricultural water management:** Real-time monitoring of water availability and flow from irrigation canals for informed decision-making; and improving water use efficiency through micro irrigation practices (drip, sprinkle irrigation, rainwater harvesting, soil moisture conservation, and multiple uses water) in mid-hills of Nepal.
- **Water and energy security for food security:** Socio-technical bundling for sustainable and scalable solar-powered water systems for irrigation and domestic use, empowering women, smallholder farmers, and youth- and women-led agribusinesses.
- **Basin and watershed scales water and climate modelling, decision support systems and environmental safeguards:** SWAT+, Water Accounting plus (WA+), hydro-economic modelling, groundwater modelling, environmental flow calculator and Coordinated Regional Climate Downscaling Experiment (CORDEX) for enhancing precision for climate projections and decision-making.

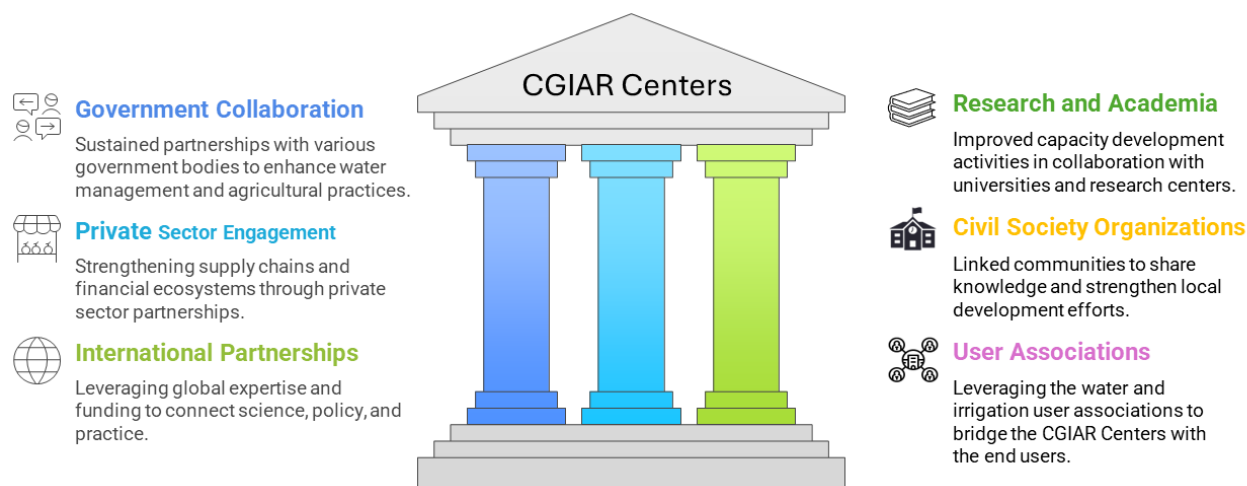
- **Improve water security and climate resilience in mountain eco-region:** Monitor and assess climate, spring and stream hydrology; delineate spring using isotopes analysis; model and monitor watershed interventions; and climate resilient water supply systems and recommend for improved watershed interventions.
- **Crisis response innovations:** Situation dashboards, monthly agrifood risk outlooks; digital groundwater monitoring; finance and digital banking products to keep mechanization and post harvest services operating during COVID and the Russia-Ukraine war shocks.
- Bio fermented rice straw technology commercialized by local cooperatives.
- **Governance and institutional practices:** Establishing local-level Multi-stakeholder Agriculture Knowledge Hubs (MAKH) as platforms for sharing and learning on crop–water–livestock–agroforestry based mixed farming systems, and municipal-level Multi-Stakeholder Platforms (MSP) for groundwater management using water–energy–food–environment nexus approaches.
- **Gender and social inclusive water:** Gender and Social Inclusion Self-Assessment Tool (GESI-SAT), Participatory Gender Training Manuals, Actors Mapping for Inclusive Water Management, Decision-Making and Benefit Sharing, and Inclusive Science-Policy-Practice Dialogues and capacity building interventions.

## 2. Partnerships

The CGIAR Centers in Nepal are working with more than 100 partners representing public institutions, civil society organizations, farmers organizations, private sector actors, research and academia, and international organizations (Figure 4).

CGIAR centers in Nepal work with over 100 partners in the following categories:

- **Public:** Closely work with ministries (Ministry of Agriculture and Livestock Development [MoALD], Ministry of Energy, Water Resources and Irrigation [MoEWRI], Department of Agriculture [DoA], Department of Water Resources and Irrigation [DWRI], government research centers (Nepal Agricultural Research Council [NARC], Water Resources and Energy Research Center [WRERC], Department of Livestock Services (DLS), National Genetic Resources Centre (Genebank), Seed Laboratories and Agriculture Development Farms. The CGIAR Centers also work with provincial and local governments.
- **Civil Society Organizations/Non-governmental organizations:** National and local NGOs, Association of Farmer Groups, Dairy, Forest User Groups, Water and Irrigation User Associations [W/IUA], and organizations and networks of women, youths and indigenous groups.
- **Private:** Seed companies, agrovets, technology developers, Small and Medium Enterprises (SMEs) and micro-finance institutions.



**Figure 4.** Working partners of CGIAR Centers in Nepal (*Source:* Authors' creation)

- **Research Partners:** ICIMOD, Universities (Kathmandu University, Tribhuvan University, Agriculture and Forestry University, Far Western University, Pokhara University), and international academic and research institutions.
- **International Organizations:** Co-Water International, SNV, OXFAM, Heifer International, Helen Keller International, iDE.

### 3. Capacity Sharing

The CGIAR Centers in Nepal co-design, deliver, and scale a range of capacity-sharing tools and programs that enable farmers, agro-vets, cooperatives, extension staff, local institutions, policymakers, practitioners, researchers, and professionals to build and share conceptual and practical skills on the technical, social, and institutional dimensions of agri-food, land, and water systems management.

- **Water–Energy–Food–Environment (WEFE) Nexus Capacity Building:** Trained 582 stakeholders (41% women; 37% disadvantaged groups) through workshops and policy dialogues, with 22 emerging leaders completing advanced courses and WEFE modules integrated into university curricula.
- **Water Systems, Climate & Policy Engagement:** Large-scale training and science–policy dialogues on water security, climate modelling, flood forecasting, WASH, springshed management, GESI, and decision-support systems—reaching over 10,000 participants (46% women) across 272 events.
- **Hydro-meteorological Monitoring & Digital Agro-Advisories:** Training for field technicians, farmers, and communities on rainfall/streamflow monitoring, soil-moisture sensing, watershed data use, seed conservation, irrigation scheduling, and digital advisory tools.
- **Solar Irrigation Pump (SIP) Skills Development:** Seven hands-on trainings for 157 technicians (41% women) to strengthen local O&M capacity, alongside development of a practical SIP troubleshooting handbook.
- **Livestock Genetic Improvement & Data Analytics:** Training of 27 professionals in advanced genetic data analysis using tools such as R and BLUPF90, focusing on breeding value estimation and performance-based animal ranking.
- **Animal Health & Feed Quality Management:** Capacity building on NIRS-based feed quality prediction and training of 16 veterinarians on transrectal ultrasonography for diagnosing reproductive disorders.
- **Village-Level Livestock Extension & Service Delivery:** Training 35 Village Livestock Promoters to operate as business-oriented service providers delivering livestock technologies in rural areas.
- **Rice Systems & Breeding Capacity Development:** Training of over 330 Nepalese scholars and 100 scientists in breeding programs; 343 professionals trained in precision agriculture, DSR, seed systems, pest management, and climate-resilient rice technologies.
- **Seed Systems & Sustainable Farming Practices:** Training on quality seed production (maize, wheat, vegetables), seed business and marketing, soil fertility, mechanization, maize seed enterprises, and improved post-harvest management.
- **Agrobiodiversity & Mixed Farming Systems:** Strengthened community seed banks and agrobiodiversity field schools (60% women participation) and trained 747 stakeholders (45% women) on systems approaches in mid-hill mixed farming systems in water-scarce regions.



Irrigated fields in the hills of Sindhupalchowk, Nepal (*photo: Aayush Niroula/IWMI*).

#### 4. Impact on Policy and Investment

The innovations and activities of the CGIAR Centers in Nepal have been well recognized by government agencies and endorsed in the policies as well. The accomplishments marked by the policies and investments made are summarized below:

- Policy uptake: Training and engagement contributed to Nepal's Irrigation Policy (2023), draft "Water Resource Bill (2024)", and embedded WEFE nexus approach into university curricula.
- IWMI contributed to the Nationally Determined Contributions (NDC) 3.0, integrating water and GESI aspects in it. Furthermore, a multi-stakeholder platform for groundwater management was uptake by Barahathwa Municipality, Madhesh province.
- Four rural municipalities in the mid-hills and Terai endorsed climate-resilient WASH plans in their annual policy and programs, and the Karnali province has allocated NPR 65.9 million (USD 462,326 ) for climate-resilient water supply systems in FY 2024/25.
- Solar irrigation finance: National subsidy windows catalyzed SIP adoption. Research led to important policy changes in AEPC's selection criteria, making SIPs more accessible to small and medium farmers by reducing land requirements. The revised subsidy policies now include a fixed quota for women farmers and clearly define local governments' role in recommending subsidies to marginalized farmers.
- Evidence to policy: IWMI's evidence-based analyses on groundwater use, irrigation performance, basin water balances, and climate risks directly informed Nepal's Irrigation Master Plan—strengthening its shift toward more efficient, inclusive, and climate-resilient irrigation development.
- Livestock systems & digital public goods: MoALD approved the Animal Identification & Traceability System (AITS); USD 223,215 invested by local governments and cooperatives to expand ILRI's Village Livestock Promoter network and extension services.
- ABC rolled out an operational framework on nutrition-sensitive agriculture using neglected and underutilized species in Nepal and supported 100 farmer field schools.
- ABC contributed to the recognition of farmers' rights and the seed system, promotion of community seed banks, and technical capacity development in drafting Agrobiodiversity Policy, 2007 and advocating for the country's membership in the International Treaty on Plant Genetic Resources for Food and Agriculture in 2009.
- CIMMYT helped advance smallholder-friendly mechanization, supported training and testing facilities for agricultural machinery, and strengthened private-sector service models that informed the Agricultural Mechanization Promotion Policy, 2014.



photo: Nabin Baral/IWMI



## 5. Technology Adopted/Made Available

In the past 10 years, the CGIAR Centers in Nepal have co-designed and tested different technologies and made them available to various actors for informed decision-making and planning.

- Hydro-meteorological monitoring packages (Automatic Weather Station, manual gauges) for micro-watershed planning.
- Partnered with federal and local government entities: Nepal's first grid-integrated solar irrigation pilot was launched in Parsa, Madhesh Province, alongside efforts to build an enabling environment for renewable-energy-powered water-lifting systems that support multiple water uses.
- Direct-seeded rice (DSR) and agronomy packages tested and disseminated with farmer co-design.
- Conjunctive irrigation options (groundwater + surface) highlighted for expansion based on the Cereal System Initiative in South Asia diagnostics.
- Online dashboard on Municipality and System Level Vulnerability, Risk and Resilience Mapping (MULVAR) and Babai Irrigation Information System (BIIS) are made publicly available for effective visualization.
- On-farm digitized feed advisor introduced for livestock keepers.
- Animal identification and traceability system for livestock keepers and other stakeholders for the selection of superior genetics based on livestock farmers' good animal husbandry practices in Nepal.
- A digital decision support tool to help livestock farmers produce improved animal diets on the farm by balancing nutrients, processing roughages, and mixing feed ingredients in proper proportions in Nepal.
- Africa Asia Dairy Genetic Gain platform: for genetic improvement of dairy cattle and buffalo.
- FemaXX Feed Additive to alter sex ratio in buffalo and produce more female calves.
- Dual purpose food-feed crop improvement.
- On-farm digitized feed advisor introduced for livestock keepers, feed companies and feed specialists.
- Biofermentation of crop residues: to upgrade nutritional quality.
- Over 3302 rice accessions conserved in the International Rice Gene Bank in the Philippines are from Nepal, impacting biodiversity conservation.
- Community Seed Banks to conserve local varieties, restore threatened crop varieties, and provide access to good quality seeds of diverse local varieties in the country.

## 6. Nepal Snapshots (Quantified Results)

This sub-section provides the overall snapshot of CGIAR initiatives in Nepal. A summary is presented in Table 1.

- In the Babai Irrigation Project, the NEXUS Gains Initiative implemented by IWMI set up key monitoring tools—including an automatic sensor, six soil-moisture sensors, a rain gauge, and 23 manual depth gauges—trained 10 irrigation operators and 36 community members, and engaged 16 WUA farmers, with the approach showing potential to reach about 36,000 Ha and more than 59,000 households and 364,080 people.
- Under the Cereal Systems Initiative for South Asia (CSISA) project in FY2017, IWMI and CIMMYT supported 81,078 farmers in applying improved irrigation practices and 26,819 Ha of land with improved technologies. In FY2019-20, 114 firms and 70,018 farmers applied improved management practices and technologies such as laser land leveler, combined harvester, self-propelled reaper, and many more over 30,669 Ha of land.
- During the 2022–23 crisis response, a combined package of access-to-finance support, digital banking services, and wider mechanization outreach helped stabilize agri-MSMEs, while groundwater monitoring systems in Nepal were expanded and upgraded.
- More than 70% of Nepal’s High-Yielding Variety (HYV) rice comes from IRRI germplasm, supported by the IRRI Gene Bank collection of about 3,000 Nepali rice lines and the provision of over 5,000 rice accessions to the country.
- More than 3,000 farmers use the feed-based intervention, over 2,000 buffalo farmers follow the reproductive health package, and 7,000 are registered in the Africa Asia Dairy Genetic Gains platform, with SAPLING innovations now spreading to other provinces.
- Over 100 staff received employment opportunities from the CGIAR Centers, and more than 50 international and national early career researchers and professionals received internship opportunities enhancing conceptual knowledge and practical skills of research in water, agriculture, agrobiodiversity and natural resources.
- IWMI engaged with 10,262 individuals (46% women) across the national and sub-national government, and non-state actor partners and stakeholders in multi-stakeholder dialogues, thematic training and workshops.
- All centers have produced various knowledge products, including policy briefs, peer-reviewed journal articles, blogs, training manuals, and videos. For example, IWMI published 346 knowledge products.



**Table 1. Summary of the achievement of CGIAR Centers in Nepal**

Project or Initiative	CGIAR Center	Focus Area	Technology or Practice Implemented	Metric Description	Impact number	Key Stakeholders
Cereal Systems Initiative for South Asia (CSISA)	IWMI and CIMMYT	Irrigation Practices	Improved irrigation practices and technology	Number of farmers supported, and land size covered	81,078 people 26,819 Ha	Farmers
		Mechanization and Management	Laser land leveler, combined harvester, and self-propelled reaper	Number of farmers, firms applying improved practices, and land size covered	70,018 people 114 firms 30,669 Ha	Farmers and firms
NEXUS Gains	IWMI	Irrigation Monitoring	Automatic sensors, soil-moisture sensors, rain gauges, and manual depth gauges	Number of households (HHs), people reached, and land size covered	364,080 people 59,000 HHs 36,000 Ha	WUA farmers, irrigation operators, and community members
PLING	IRRI	Livestock / Dairy Genetics	Reproductive health package and genetic platform registration	Number of buffalo farmers registered on the platform	7,000 number	Buffalo farmers
Multiple projects and initiatives	IWMI	Capacity Building	Multi-stakeholder dialogues, thematic training, and workshops	Number of farmers registered	3,000 people	Farmers
		Genetic Gains / Crop Yield	High-Yielding Variety (HYV) rice germplasm origination	Number of individuals engaged	10,262 people (40% female)	Government and non-state actor partners
Multiple projects and initiatives	IRRI	Genetic Gains / Crop Yield	High-Yielding Variety (HYV) rice germplasm origination	HYV rice origination	70%	
				Nepali rice line collection	3000	
Multiple projects and initiatives	IWMI	Water resource, GEDSI, governance, climate change,	Knowledge products	Rice accessions	5000	
				Number	364	Academia, government, private sector, and civil society organizations

## Future Priorities

Moving forward, the CGIAR Centers in Nepal will focus on areas where research, innovation, and partnerships can deliver practical solutions for food, water, nutrition, and climate challenges. These future priorities aim to strengthen agri-food systems, improve resilience, and ensure inclusive and sustainable development outcomes.

Collective efforts of the CGIAR Centers, Programs, Accelerators, and partners to strengthen the enabling environment, including through strategic partnerships, blended financing mechanisms, scaling hubs, and shared capacity for scaling innovations—will be a core approach.

### 1. Water Systems & Climate Resilience

- Transform water and irrigation management for resilient agri-food systems.
- Promote climate-adaptive water solutions and strengthen water resilience.
- Advance river-basin planning through better data, science, and governance.
- Scale water–energy–food nexus solutions through public–private–community partnerships.
- Expand nature-based solutions for groundwater and springshed management.
- Strengthen inclusive water governance with focus on gender equality, youth, social inclusion, and locally led adaptation (LLA).

### 2. Climate-Smart Crops & Seed Systems

- Increase adoption of climate-resilient, stress- and disease-tolerant crop varieties.
- Strengthen inclusive and market-oriented seed systems.
- Improve rice-based systems for higher productivity, affordability, and resilience.
- Protect and mainstream traditional mountain species and agrobiodiversity.
- Put nutrition and health at the center of crop improvement to address the triple burden of malnutrition.

### 3. Sustainable Livestock Systems

- Accelerate genetic improvement using digital platforms (e.g., AADGG) and improved breeding strategies.
- Address fertility challenges in buffalo and enhance reproductive health services.
- Improve feed, forages, herd health, and vaccine quality systems.
- Upgrade crop residues and promote nutrient-dense forage production.
- Support sustainable livestock value chains and animal productivity.

### 4. Markets, Food Systems & Nutrition

- Strengthen market-driven production and competitive value chains.
- Expand supply systems that respond to evolving consumer demand.
- Promote healthier and more sustainable diets by reshaping the food environment.
- Enhance food security and national self-sufficiency through efficient agri-food systems.

### 5. Innovation, Digital Tools & Institutional Strengthening

- Scale digital platforms for diet optimization, data-driven planning, and service delivery.
- Promote business-based models for delivering inputs, services, and knowledge.
- Strengthen local institutions and partnerships across public, private, and community sectors.
- Accelerate need-based technology transfer, capacity building, and knowledge sharing.



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