ICARDA Country Brief Series

Ethiopia

Photo credit: Tesfaye Getachew Mengistu on 8 February 2020. A flock of improved Menz sheep from ICARDA community-based sheep breeding program grazing on wheat stubble in Molale village, dry highlands of Amhara Region, Ethiopia.

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Acronyms

AfDB	African Development Bank
AID-CSB	AI-Driven Climate Smart Beekeeping for Women
ALAD	Arid Lands Agricultural Development
EIAR	Ethiopian Institute of Agricultural Research
GDP	Gross Domestic Product
ICARDA	International Centre for Agricultural Research
MoARD	Ministry of Agriculture and Rural Development
PIF	Agricultural Sector Policy and Investment Framework
PIM	Policies, Institutions, and Markets
PPB	participatory plant breeding
PSNP	Productive Safety Net Program
R&D	research and development
SARD-SC	Support to Agricultural Research for Development of Strategic Crops in Africa
SLU	Swedish University of Agricultural Sciences
TAAT	Technologies for African Agriculture Transformation
USAID	United States Agency for International Development

Introduction

The International Center for Agricultural Research in the Dry Areas (ICARDA) country series provide a snapshot of the work ICARDA has done and what is on-going in the different countries in which ICARDA operates. It highlights the projects implemented, the partnerships that ICARDA has formed for both project delivery and knowledge generation, the key research themes by ICARDA Scientists and features a summary of the impact ICARDA projects have delivered to the citizenry, especially the rural poor smallholder farmers.

About ICARDA

Established in 1977, ICARDA is a non-profit, CGIAR Research Center that focusses on delivering innovative solutions for sustainable agricultural development in the non-tropical dry areas of the developing world.
We provide innovative, science-based solutions to improve the livelihoods and resilience of resource-poor smallholder farmers. We do this through strategic partnerships, linking research to development, and capacity development, and by taking into account gender equality and the role of youth in transforming the non-tropical dry areas.

Agriculture in Ethiopia

Ethiopia's economic development relies on the agriculture sector, comprised mainly of smallholder farmers and contributing to over a third of Ethiopia's GDP, 67% of total employment and most of exports[1].

Climate-resilient agriculture solutions are needed in Ethiopia in light of several challenges: (1) unsustainable land management practices which result in an estimated loss of 2 billion tons of fertile soil annually, (2) Ethiopia's fast-growing population (2.6% annual growth rate), (3) droughts, including the recent 2015 drought induced by El Niño and 2017 Indian Ocean Dipole drought, and (4) limited uses of irrigation for intensification/diversification of the agriculture system,[2]. Other challenges that the agriculture sector must consider when developing and implementing research for development projects include ensuring availability and access to improved technologies for achieving impact at scale, high levels of youth unemployment, and low levels of internet and digital literacy in rural areas.

Action is being taken to build resilience of the agriculture sector and food systems in Ethiopia. Shifting away from an emergency food aid dominated response to droughts and crises, the Ethiopian government launched the Productive Safety Net Program (PSNP) in 2005, which pays able-bodied participants for labor or provides unconditional payments for participants who cannot work[3]. The national agriculture policy, *Ethiopia's Agricultural Sector Policy and Investment Framework (PIF) 2010-2020* seeks to develop the agriculture sector in four key areas: 1. achieve a sustainable increase in agricultural productivity and production; 2. accelerate agricultural commercialization and agro-industrial development; 3. reduce degradation and improve productivity of natural resources; and 4. achieve universal

[1] World Bank World Development Indicators 2020, 2019
[2] IFAD Ethiopia Profile: https://www.ifad.org/en/web/operations/w/country/ethiopia
[3] Productive Safety Net Program (PSNP). IFPRI. https://essp.ifpri.info/productive-safety-net-program-psnp/

food security and protect vulnerable households from natural disasters. Partners such as ICARDA are developing and deploying climate-resilient solutions to food production and agriculture practices.

ICARDA in Ethiopia

Ethiopia collaborated with the Arid Lands Agricultural Development (ALAD) before the establishment of ICARDA. The presence of ICARDA in Ethiopia extends back to 1978, in collaboration with the Ethiopian Institute of Agricultural Research (EIAR), focusing on germplasm exchange and training. Through these collaborations significant impacts have been achieved made in generating and scaling improved technologies leading to increased productivity and production towards achieving food and nutrition security in the country. In 2009, partnership with the Ministry of Agriculture and Rural Development (MoARD) was formalized through the signing of a Memorandum of Understanding[4]. ICARDA's leading areas of research and development (R&D) in Ethiopia include the following:

Barley
Since 1984, ICARDA has conducted both food and malt barley R&D activities, many in collaboration with EIAR. The barley program is also helping to introduce improved varieties and participatory plant breeding (PPB) approaches, where farmers are genuine research partners, making decisions on germplasm selection, even on design and implementation of trials[2]. Most recently, with USAID funding ICARDA has been working to scaling out malt barley, faba bean and chickpea technologies in the highlands of Ethiopia. The projects have successfully demonstrated and scaled out improved crop varieties and integrated crop management practices, strengthened the national seed systems to ensure availability and access to quality seed and trained thousands of smallholder farmers, resulting in adoption of improved varieties and farming practices.[5]

Wheat
Both bread and durum wheat breeding activities in Ethiopia have focused on developing biotic and abiotic stress tolerant improved wheat varieties. During early 2010s, ICARDA through USAID support initiated early generation seed production under irrigation and has demonstrated the potential for expanding wheat production frontiers to irrigated lowlands from the traditional rainfed highland production. This work expanded to identification of heat tolerant wheat varieties under the Support to Agricultural Research for Development of Strategic Crops in Africa (SARD-SC) project and scaling them under the Technologies for African Agriculture Transformation (TAAT) 1 project both funded by AfDB. ICARDA in partnership with EIAR plays key roles in demonstrating and expanding irrigated wheat innovations in lowlands of Ethiopia.

From 2008-2014, ICARDA and EIAR collaborated in identifying stem and yellow rust and releasing several resilient varieties which were scaled and adopted by farmers with significant impacts in increasing productivity and production. Moreover, shuttle breeding techniques have been leveraged to test new varieties in hot spots for wheat rust to identify rust resistant varieties. Successful rust resistant varieties are identified, released and scaled. Research activities also track the spread of rust pathogens.

Food legumes
Cool season food legumes (faba bean, Kabuli chickpea, and lentil) breeding activities in Ethiopia released several high grain yield and high grain quality), abiotic and biotic stress tolerant varieties in Ethiopia. The release of waterlogging resistant faba bean varieties enabled extending production in vertisol areas and the release of orobanche (parasitic weed) resistant variety revived faba bean production in northern Ethiopia where the crop was abandoned for some time. The introduction of Ascochyta blight Kabul chickpea varieties enabled the expansion of chickpea area in the country and export market.

Small ruminant breeding
ICARDA has led several successful community-based breeding programs to improve the health and size of sheep, thereby increasing the incomes of smallholder farmers for sheep production and fattening.

[4] Communication Team ICARDA. (21/12/2010). Ethiopia and ICARDA. Aleppo, Syria: International Center for Agricultural Research in the Dry Areas (ICARDA).
[5] Zewdie Bishaw. (6/4/2016). Scaling out Malt Barley and Grain Legume Technologies in the Highlands of Ethiopia. Amman, Jordan: International Center for Agricultural Research in the Dry Areas (ICARDA).

ICARDA projects in Ethiopia

Below are summaries of all active projects in Ethiopia as of August 2021. For a summary table with exact dates, budget, and project manager, see Annex A. Note that the budget amounts indicated are the total project budgets, not the share specific to ICARDA Ethiopia operations.

Inter and intra-household impact of food legume production on technical efficiency, income and agroecological transformation in Ethiopia (2020-2021 | $75,000)
The project aims at assessing the impact of introduction of improved legumes on economic and agroecological indicators in contrasting agricultural livelihood systems. The intervention sites are South Wollo and Bale administrative zones in the north and south east of the country, respectively. The project involves about 1150 randomly selected farm households.

Technologies for African Agriculture Transformation TAAT - Phase I (2018-2021 | $2,167,000 | website)
Active also in, Kenya, Mali, Nigeria, Tanzania, Zimbabwe, and Sudan, in Ethiopia the TAAT project focused on community-based approaches to sheep breeding, with the aim to fatten sheep using locally available feed, thereby reduce their total price in market.

AI-Driven Climate-Smart Beekeeping for Women (AID-CSB) (2021-2022 | $420,000 | Project MEL Page)
AID-CSB aims to support biodiversity and enable improved hive management among women, using a gender-sensitive, participatory process to localize a hive management app. In 2021, a localized Amharic version of the Beekeeper's Companion app was generated and smartphone training was conducted to build digital capacity among beekeepers. In 2022, the project aims to increase app adoption, use, and add a new honeybee "Symptom Checker" feature.

CGIAR Research Program on Livestock Agri-Food Systems (2017-2021 | $7,837,918 | website)
Also active in Tanzania, Vietnam and Uganda, in Ethiopia, this initiative aims to unlock the potential of small ruminants in Ethiopia through the development of equitable, sustainable and efficient sheep and goat value chains. This is being done through (1) boosting productivity, (2) income generation activities, (3) ensuring environmental sustainability, (4) facilitating service delivery, and (5) building partnerships.

CGIAR Research Program on Policies, Institutions, and Markets (PIM) - Phase II (2017-2021 | $0.5 million)
Active in Egypt, Ethiopia, Afghanistan, and Ethiopia, PIM's research provides support for policies that help poor farmers, both men and women, improve their lives; produce nutritious and affordable foods; and protect the soil, water, and biodiversity in rural landscapes. In Ethiopia, ICARDA's agro-pastoral research focuses on rangeland management and land governance and tenure.

Upscaling of Small Ruminant Community-Based Breading Program in Ethiopia (2018-2022 | $556,000 | 2020 report)
Recognizing the success of community-based breeding approaches since 2010, this project aims to increase the scale of such projects by 1. Strengthening small ruminant community-based breeding programs (CBBPs) 2. Designing breeding structure and disseminating improved genotype 3. Establishing database and recording system 4. Monitoring and evaluating the breeding program 5. Market linkages 6. Establishing field solutions for dissemination of improved genetics.

Faba Bean in Ethiopia - Mitigating Disease Constraints to Improve Productivity and Sustainability (2020-2023 | $240,000 | website)
This project is led by University of Western Australia and EIAR but ICARDA and NSWDPI are partners in the project. This project aims to improve reliability, productivity, and profitability of faba bean production through generation and scaling of integrated management of new faba bean gall disease affecting faba bean production in the high lands of Ethiopia. ICARDA is a partner in this project in providing germplasm, involve in coordinating project implementation in Ethiopia.

Green Innovation Centers: Promoting Climate-resilient Legume Value Chain Systems in Ethiopia (2020-2023 | $300,362)

ICARDA is scaling up the adoption of good and integrated crop management techniques and of new faba beans varieties such as Walki, Dosha, Gora and Numan a high-yielding, disease-resistant adapted to different agroecologist in Oromia and Amhara regional states.

Durum wheat genetic resources can help mitigate negative impact of climate change in Ethiopia, and beyond, though developing its climate-resilient cultivars (2021-2023 | $1,344,000)
The project, a Swedish University of Agricultural Sciences (SLU), EIAR and ICARDA collaboration, aims to develop and supply drought tolerant durum wheat germplasm to breeders for eventual release of new cultivars that can produce high grain yield and rich in quality protein for cultivation under rainfed conditions in drought-prone areas, thereby enhance food and nutritional security and improve rural livelihoods. This will be achieved through phenotyping and genotyping durum wheat germplasm resources for their tolerance to drought in the field characterizing durum what orthologues of genes that are known to contribute to abiotic stresses in other cereals and use in marker assisted selection; and induce somaclonal variation and develop hybrids for combining favorable alleles contributing to these traits.

Protecting Ethiopian lentil crops (2021-2026 | $1,556,000 | project website)
This project is led by University of Western Australia and EIAR but ICARDA and NSWDPI are partners in the project. The project will mobilize the best expertise in Australia and ICARDA to support lentil breeding and pathology researchers at EIAR, provide germplasm with high level of resistance to target diseases, establish sustainable disease management, thereby restoring resilience of a farming system under threat from diseases of lentil. It will deliver to smallholders growing lentils in the cereal-based cropping systems of Ethiopia the solutions needed to maintain and improve their current lentil cropping practices, their cereal crops, and their livelihood.

ICARDA project value in Ethiopia

The next graph depicts the value of ICARDA projects in Ethiopia from 2016-2022, based off of past, current, and planned projects. Overall there is a declining trend in project value, with major decline in project value in 2018 and 2019. This decline was due to the end of five high-value projects:

- Deployment of Malt Barley and Faba Bean Varieties and Technologies for Sustainable Food and Nutritional Security and Market Opportunities in the Highlands of Ethiopia ($3 million)
- Better livelihoods for small holder farmers through knowledge based technology interventions in the highlands of Ethiopia: For example, increasing the productivity of chickpea in wheat-based cropping system ($1.67 million)
- Improving the Performance of Pro-Poor Sheep and Goat Value Chains for Enhanced Livelihoods, Food and Nutrition Security in Ethiopia ($1.2 million)
- Designing effective extension service delivery systems for enhancing wider adoption of agricultural technologies ($0.6 million)
- Unlocking the Potential of Grass pea for Resilient Agriculture in Dry Environments (UPGRADE)" for period July 2018 to June 2019 ($0.23 million)

1: Trajectory of ICARDA project value in Ethiopia (Source: MEL, August 2021)[6]

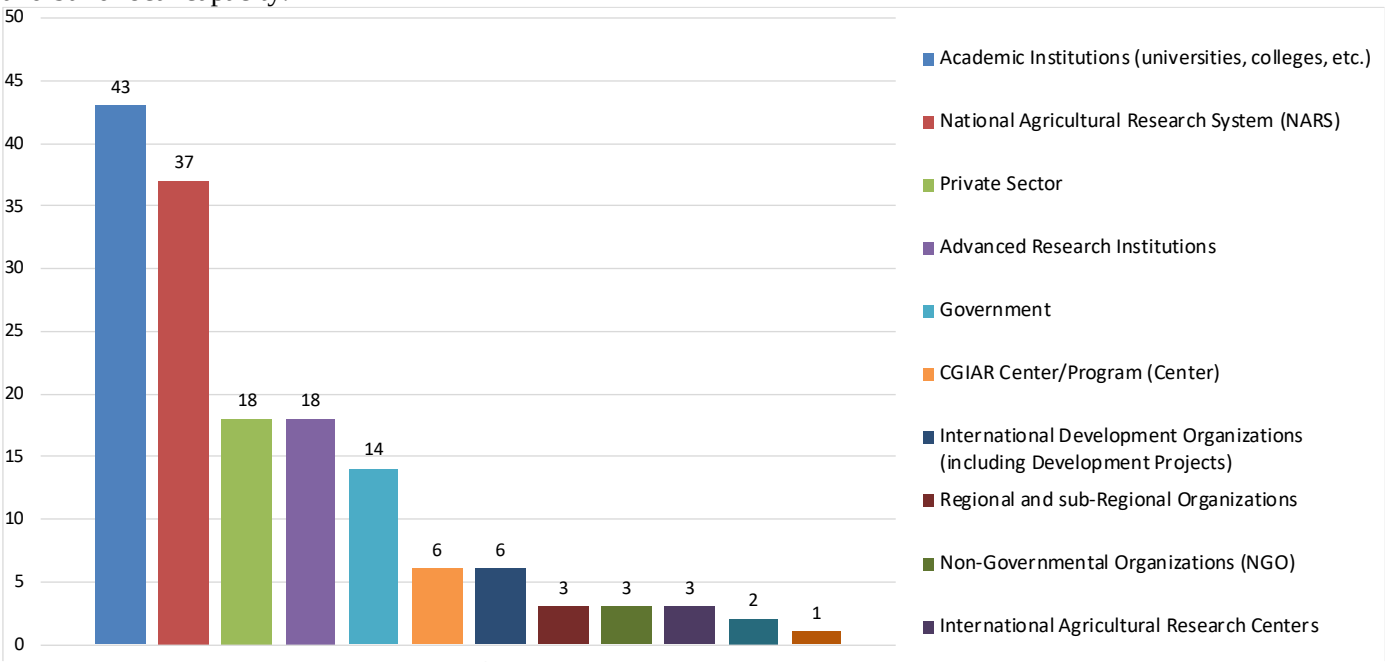
[6]Several assumptions were made in order to create this graph. Assumptions include: (1) All budget data in OCS at the time of data pull was up to date. (2) For multi-country projects, funds are distributed equally among countries. (3) Project spending is equally divided across all years.

Partnerships

ICARDA engages a number of local, national, regional and international entities as a means of ensuring effectiveness and efficiency of knowledge generate and project delivery at scale. This section highlights the 154 partners with which ICARDA's Ethiopia projects have worked both in project delivery and knowledge generation and dissemination.

Project delivery partners

Over the years, ICARDA has partnered with over 154 entities on projects in Ethiopia. The broad base of academic and NARS entities involved provide a solid evidence of the technical and policy related framework ICARDA operates. Future actions may involve more NGOs and CBOs to deliver impact and build local capacity.



Knowledge generation partners

ICARDA partners with a wide range of partners in the generation and dissemination of scientific knowledge, in a bid to increase the uptake of research outputs and influence policy-makers to create an enabling environment for the advancement and adoption of agriculture technologies at scale. Over the past 5 years, ICARDA has partnered with 210 partners to generate 784 knowledge products in Ethiopia. Those who have generated 5 or more knowledge products in partnership with ICARDA are listed in Figure 3 below.

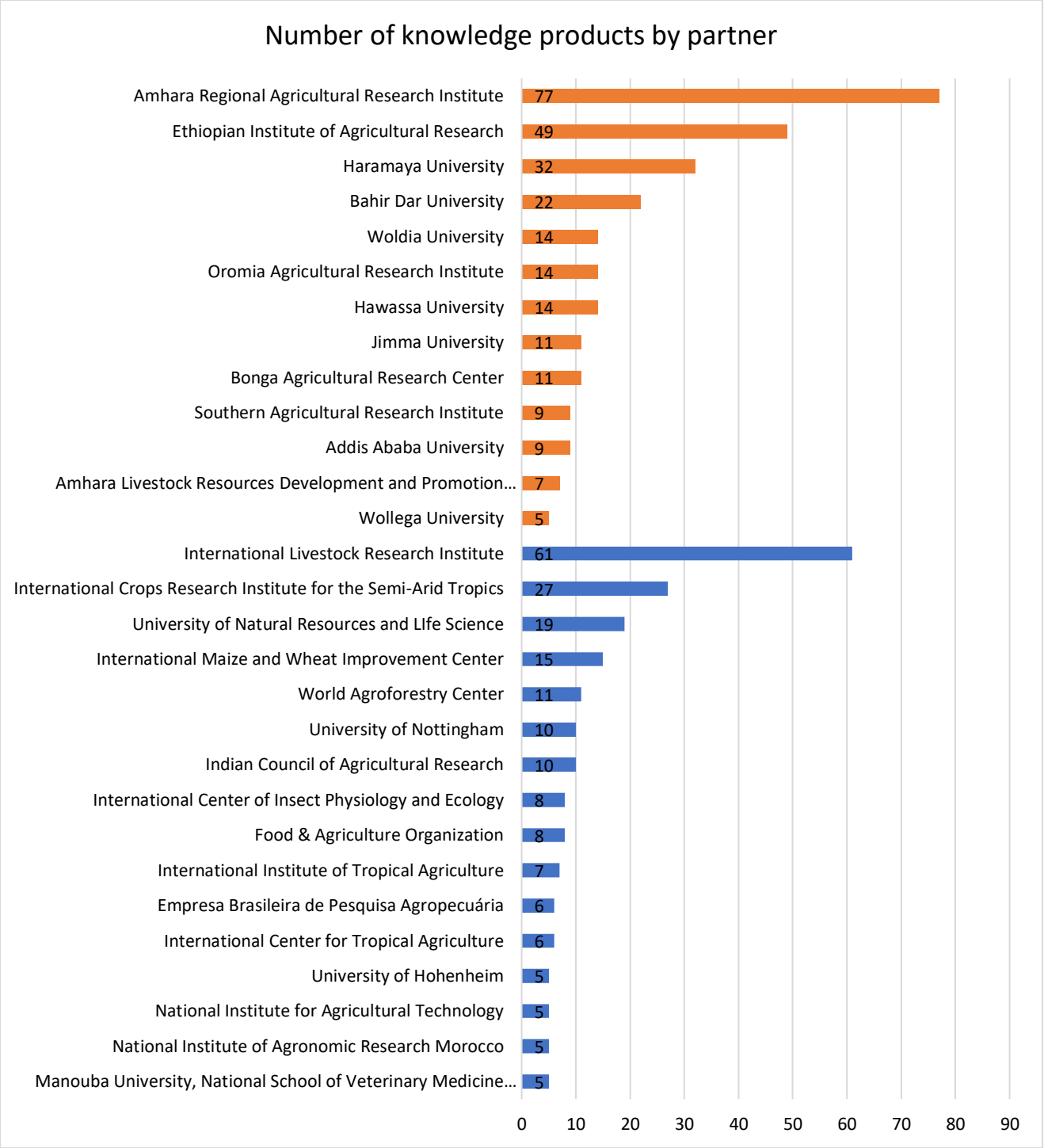


Figure 2: Distribution of knowledge product collaborations amongst institutions (Source: MEL August 2021, Elaboration: MEL)

Capacity Development

In Ethiopia, ICARDA capacity development work has involved the training of 3,169 men and 774 women through group trainings, and 21 men and 1 woman for individual post-graduate degrees, such as PhD or Master's work (Figure 3). The line graphs depicting group training show a decreasing trend of participant numbers and both graphs depict gender disparities in which many more men are participating in individual degrees and group trainings. The accuracy of this data depends on the accuracy of reported capacity development activities in MEL (Figure 3).

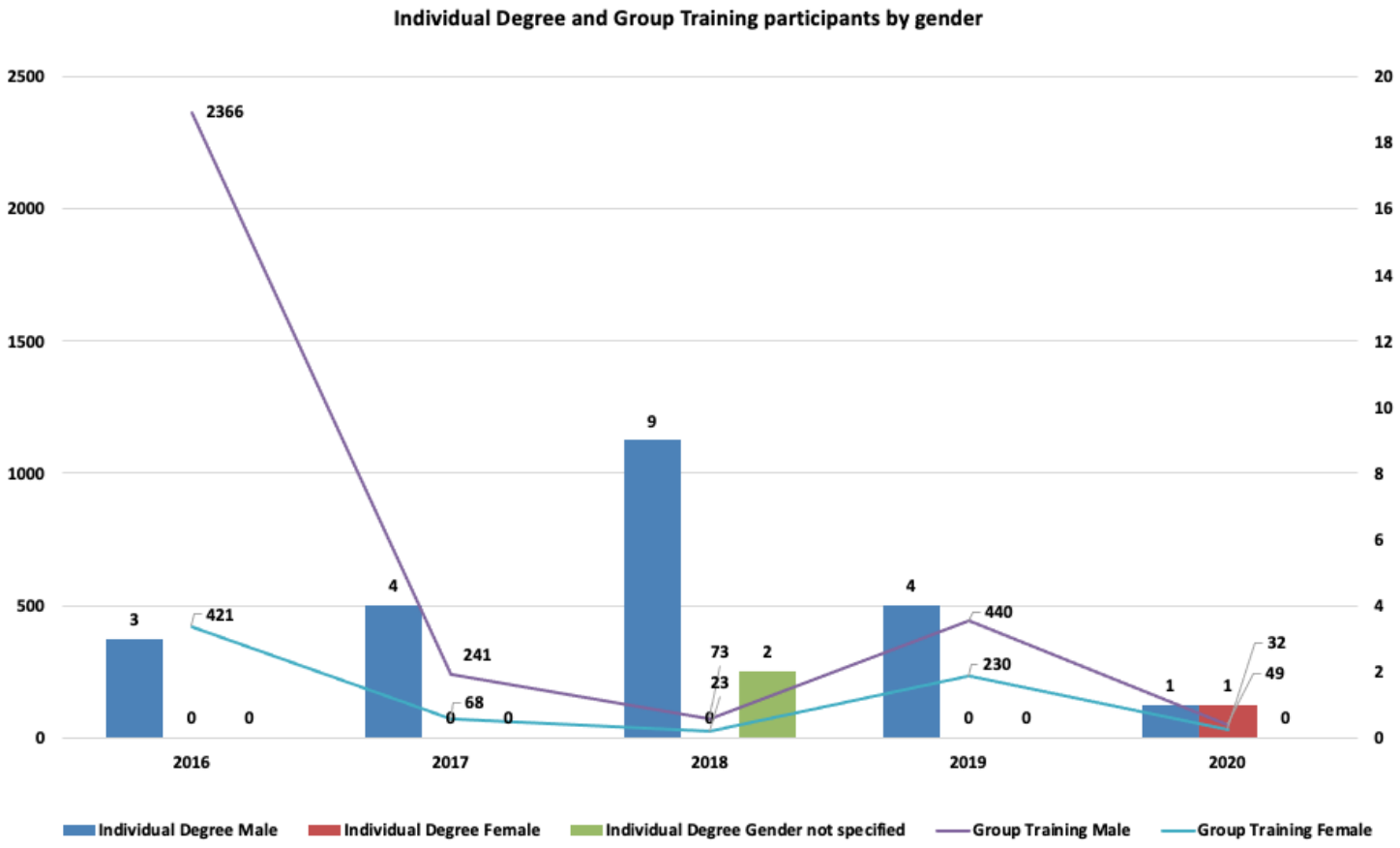


Figure 3: Capacity Development in Ethiopia (Source: MEL August 2021)

Research themes

The research themes ICARDA scientists have worked on with respect to Ethiopia are key insights, on where the largest share of ICARDA work in the country lies, and can be a useful precursor to where the most impact will be created. Figure 3 is a demonstration of the top ICARDA research themes on Ethiopia. These account for 807 out of the 3,045 thematic area mentioned. The top key areas are related to sheep fattening, small ruminants, livestock, and similarity mapping.

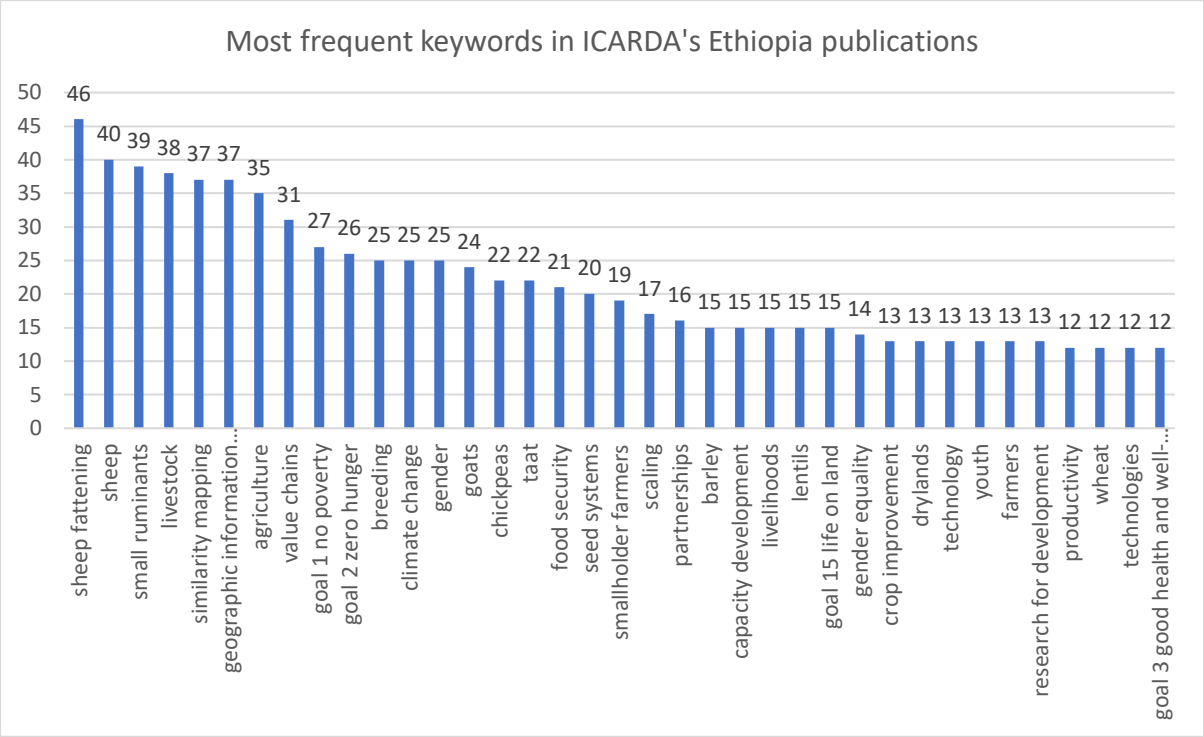


Figure 4: Frequency of research themes within ICARDA publications on Ethiopia (Source: MEL, August 2021)

Variety development

As part of the varietal development process ICARDA partnered with federal and regional agricultural research systems where through multi-location trials crop varieties well adapted and suitable for different agro-ecological zones within its areas of operation have been identified and scaled out to research smallholder farmers. Ethiopia has participated and benefitted from this process with a total of 781 trial lines of chickpea, lentil, faba bean, grass pea, barley and wheat that have been provided to NARS since 2009 (Figure 5).

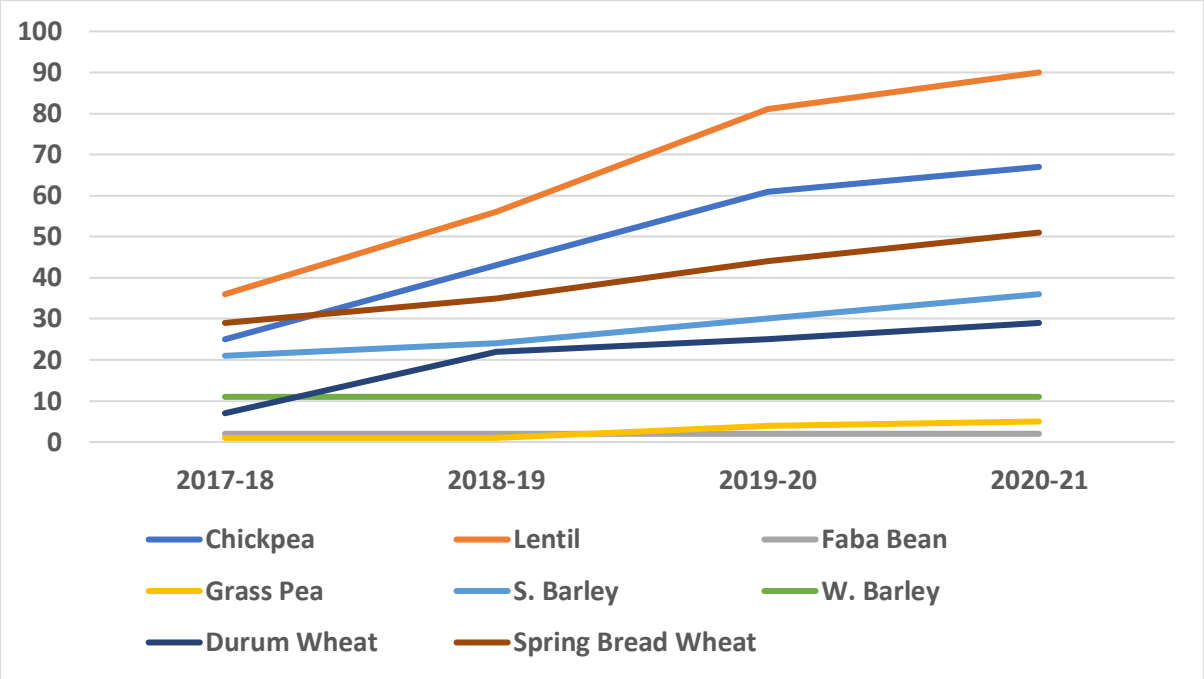


Figure 5: ICARDA materials under development distributed through international nurseries to Ethiopia (Source: INDMS 2021)

Variety release

Variety release is a key pre-requisite for taking crop technologies to scale through wide distribution networks. ICARDA has contributed to the release of 41 varieties of 7 crops by the Ethiopian government. The crops include food and malt barley, chickpea, faba bean, lentil, field pea and durum and spring bread wheat (Figure 6). The release of ICARDA-germplasm origin by NARS has been consistent since 1983 (Figure 7). It is evident a positive annual trend of releasing varieties and the constant injection of improved technologies every year. The ICARDA-supported varieties released were bred for increased grain yield and better grain quality, tolerance or resistance to disease, water-deficit environments, among others which are adapted and preferred by the farmers, the industry and the consumers (**Error! Reference source not found.**).

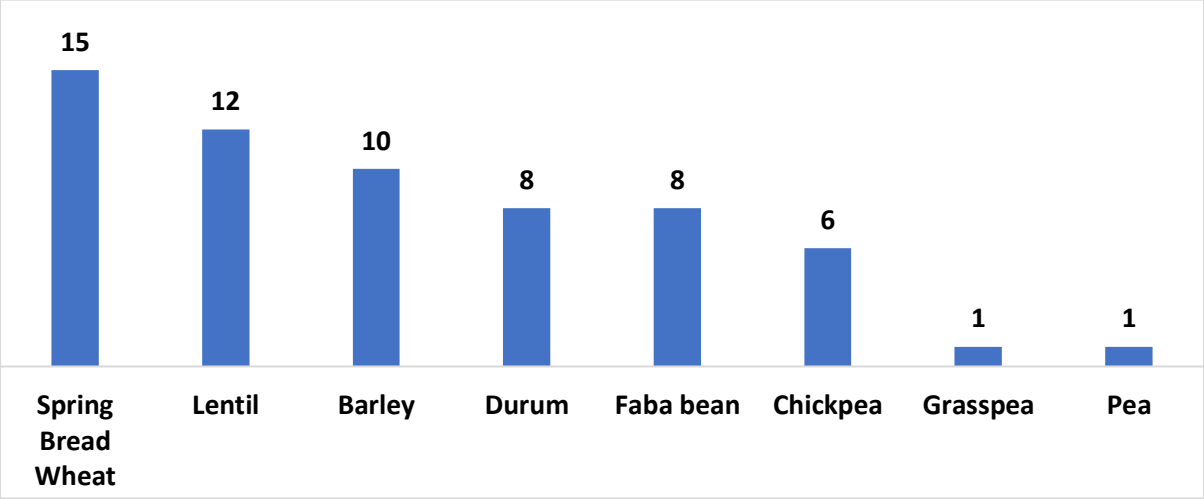


Figure 6: Varietal releases from ICARDA germplasm by the Ethiopian NARS from 1983-2020 (Source: INDMS 2021)

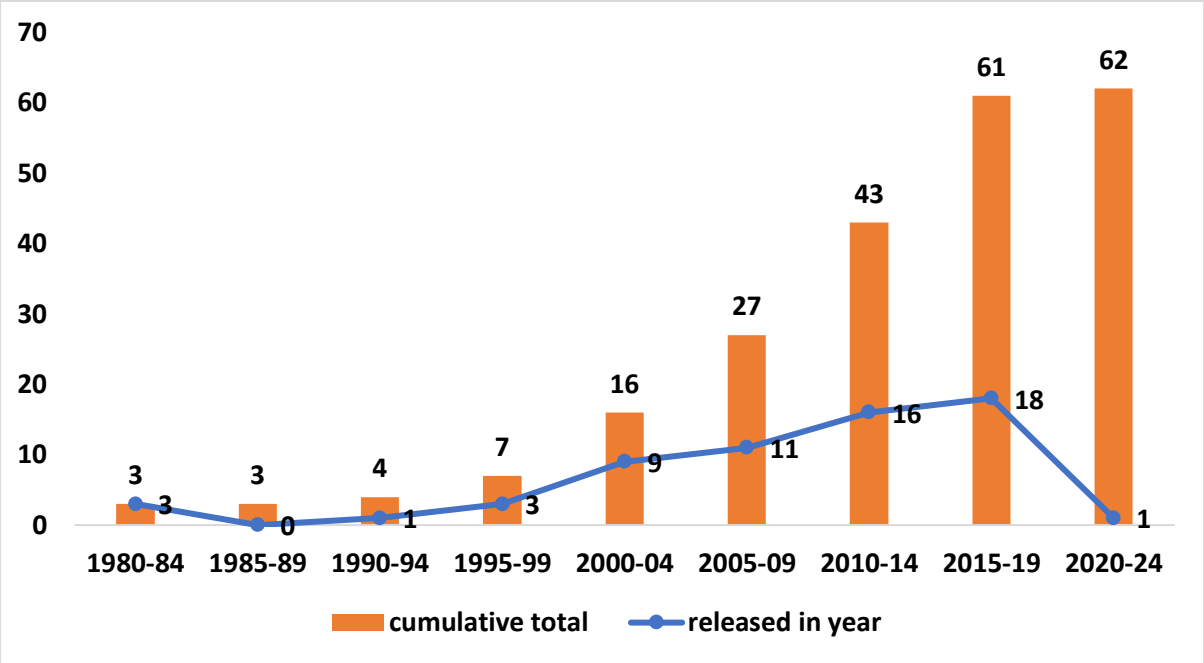


Figure 7: Trend of ICARDA germplasm release by the Ethiopian government (Source: INDMS 2021)

Impact assessment of some technologies promoted by ICARDA in Ethiopia

Below are summaries of research conducted on the impact of ICARDA-promoted technologies and practices in Ethiopia.

ICARDA-promoted rust-resilient wheat varieties increase productivity, yield, and cash income
Intervention: Promoted rust-resilient wheat varieties in intervention villages. Awareness, adoption, and productivity were then compared between intervention and non-intervention villages, and adopters and non-adopters of the rust-resilient varieties.

Impact: Resulted in improved farmer awareness of rust-resilient wheat varieties, however adoption of rust-resilient varieties did not differ between intervention and non-intervention villages as there was likely sharing of information from intervention farmers to non-intervention farmers. Farmers adopting the rust-resilient varieties had improved wheat productivity, total yield, and increased cash income. Finally, the project resulted in institutional innovations to fast track variety testing and release, increase seed multiplication, convene seed sector actors to meet farmer demand, and develop an early warning system for wheat rusts.

Study title & source: Zewdie Bishaw, Dawit Alemu, Abebe Atilaw, Abebe Kirub. (1/11/2016). Containing the Menace of Wheat Rusts: Institutionalized Interventions and Impacts. Addis Ababa, Ethiopia: Ethiopian Institute of Agricultural Research (EIAR). (MEL link)

Heat-tolerant wheat varieties scaled, resulting in an estimated $21 million saved in Ethiopia
Intervention: Wheat breeding and participatory testing with farmers, farmer capacity building, innovation platform, policy development, and key-stakeholder relationships all supported the development, release, and scale up of heat-tolerant wheat varieties in Ethiopia.

Impacts: (1) climate-resilient, high-yielding, heat-tolerant varieties, bred and introduced by ICARDA expanded wheat production in irrigated lowland areas and traditional rainfed highland areas during the off-season; (2) policy advocacy supported the Government of Ethiopia established a committee among its Agricultural, Finance, Trade, and Industry, and Water and Irrigation Ministries and expanded the wider adoption of new methodologies, significantly improving water resource management; (3) a total wheat production of 84,000 tons was produced, which, at the projected conservative price of US$ 250, can save Ethiopia about US$ 21 million.

Study title & source: ICARDA. High yielding heat-tolerant wheat varieties for Sub-Saharan Africa. (Link)

ICARDA-developed malt barley varieties scaled to new regions of Ethiopia
Intervention: Awareness building of improved malt barley varieties, increasing involvement of farmers in seed multiplication and marketing, building capacity of actors along the value chain, and provision of seeds.

Impact: New higher-yielding malt barley varieties were introduced and scaled up within the Amhara region and Ethiopian highlands.

Study title & source: Zewdie Bishaw, Adamu Molla Tiruneh. (5/4/2021). Deployment of Malt Barley Technologies In Ethiopia Achievements and Lessons Learned. Lebanon: International Center for Agricultural Research in the Dry Areas (ICARDA). (MEL Link)

Improved legume varieties developed by ICARDA and adopted by farmers
Intervention: Improved legume varieties developed and conservation agriculture practices promoted, including intercropping with legumes and maize-legume crop rotation.

Impact: High adoption rates of improved legume varieties (67% of the plots in the final sample were cultivating improved varieties)

Study title & source: Kosmowski, Frederic, Alemu, Solomon, Mallia, Paola, Stevenson, James, and Macours, Karen. Supplementary materials for report “Shining a Brighter Light: Comprehensive Evidence on Adoption and Diffusion of CGIAR-Related Innovations in Ethiopia.” Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2021-12-14. https://doi.org/10.3886/E124681V10

Community-based breeding programs improve growth of sheep, farmer incomes, and meat consumption
Intervention: Community-based breeding programs are an innovative genetic improvement strategy that considers the farmers’ needs, views, decisions, and active participation, from inception through to implementation and ownership of the program. This study evaluated the biological and socioeconomic performance of CBBPs for three sheep breeds in Ethiopia based on 8 years data.

Impact: Growth performance of the sheep increased substantially and the socio-economic impact analysis revealed increase in income (20%) and farm-level meat consumption (from slaughter of one sheep per year to three).

Study title & source: Community-Based Breeding Program is an attractive option for genetic improvement of small ruminants. 2019. (MEL Link)

Stone bunds reduce downslope runoff, further research needed to understand impact on erosion

Intervention: embankments of stones were built along the contour lines during the last years. These stone bunds reduce downslope surface runoff and therefore also soil erosion decreases.

Impact: No significant difference in soil erosion was detected due to measurement error, however the downslope runoff on the treated plot decreases by 77 % and the lateral runoff increases by 307 %.

Study title & source: Assessments on the impact of stone bunds on water erosion in the Gumara-Maksegnit watershed, Northern Ethiopia. 2015. (MEL Link)

Innovations

The five most recent innovations in Ethiopia reported in the CGIAR dashboard include:

A toolkit to guide facilitation of multi-stakeholder platforms in Ethiopia (2020)
Innovation: This toolkit is meant to be used in supporting CRP Livestock partners and other users at the district and community level to establish and manage multi-stakeholder platforms (MSPs) effectively.

Stage of innovation: Stage 2: successful piloting; toolkit has been tested and is available for use
Source:
https://marlo.cgiar.org/summaries/Livestock/projectInnovationSummary.do?innovationID=1904&phaseID=150

Breeding programs for goats in pastoral areas of Ethiopia (2020)
Innovation: ICARDA designed and implemented programs in 4 pastoralist communities of Ethiopia which consider the breeding objectives of the community, their mobility pattern, and resource base.

Stage of innovation: Stage 3: available/ ready for uptake; Pilots have been completed and framework is available for use.
Source:
https://marlo.cgiar.org/summaries/Livestock/projectInnovationSummary.do?innovationID=1876&phaseID=150

Business models developed for three best-bet interventions for small ruminant value chains in Ethiopia (2018)
Innovation: 1 sentence Business models were developed, tested, and recommended for three best-bet interventions, namely sheep fattening, ram selection and market information system.

Stage of innovation: Stage 3: available/ ready for uptake
Source:
https://marlo.cgiar.org/summaries/Livestock/projectInnovationSummary.do?innovationID=584&phaseID=60

Community based gastrointestinal parasite control in small ruminants in Ethiopia (2018)
Innovation: This approach tackles parasite control at community level leading to quicker impact than traditional farmer-training approaches.

Stage of innovation: Stage 2: successful piloting; Positive impact at community level demonstrated on parasite control, with willingness of communities to engage

Source:
https://marlo.cgiar.org/summaries/Livestock/projectInnovationSummary.do?innovationID=746&phaseID=60

Community conversation as a gender transformative approach in livestock health management
Innovation: Leverages interactive methods such as visual aids, role plays, and storytelling to engage community members in dialogue on gender inequalities related to livestock health management and risk of exposure to zoonoses.

Stage of innovation: Stage 2: successful piloting; 4 modules successfully rolled out with 2 more modules to be added in 2019 and plans made to incorporate approach in extension.

Source:
https://marlo.cgiar.org/summaries/Livestock/projectInnovationSummary.do?innovationID=573&phaseID=60

Policy Contributions

There are no ICARDA policy contributions reported in the CGIAR dashboard.

Opportunities in Ethiopia

Given ICARDA's long-term presence and experience in Ethiopia collaborating with national partners and farmers, ICARDA is well-positioned for future work in Ethiopia that considers unique opportunities within Ethiopia's agricultural sector, along with critical global challenges and trends.

What opportunities are present?

- Generating new and improved technologies across Ethiopia's diverse agroecologies, farming systems, and cropping systems
- Aligning agricultural initiatives with national interests and government commitments (e.g. wheat self-sufficiency)
- Partnering with other centers though One CGIAR and developing projects for funding, rather than competing
- Expanding and scaling initiatives to East Africa highlands (e.g. legumes & barley)

What global challenges and trends can be addressed

- Climate change, considering its widespread effect on all sectors and high donor priority
- Food and nutritional security, overcoming challenges of drought, conflict, and consumer affordability
- Natural resources management (land degradation, soil fertility, acidity, salinity, waterlogging)
- Cropping systems diversification/intensification (cereals/legumes/livestock)
- Livestock value chain, including the integration of the successfully piloted *Toolkit to guide facilitation of multi-stakeholder platforms in Ethiopia (2020)*

Annex A: Summary of ongoing and recent projects in Ethiopia (Source: MEL August 2021)

Project Title	Total grant value [7](USD)	Countries	Donor	Date from	Date to	Project Leader
Inter and intra-household impact of food legume production on technical efficiency, income and agroecological transformation in Ethiopia	75,000	Ethiopia Egypt Lebanon Morocco Tunisia Sudan	International Centre for Research in Agroforestry	2020-12-01	2021-09-30	Girma Tesfahun Kassie
Technologies for African Agriculture Transformation TAAT - Phase I	2,167,000	Ethiopia Kenya Mali Nigeria Tanzania Zimbabwe Sudan	IITA, AfDB	2018-02-19	2021-11-30	Solomon Gizaw Assefa & Zewdie Bishaw
AI-Driven Climate-Smart Beekeeping for Women (AID-CSB)	420,000	Ethiopia Uzbekistan	German Federal Foreign Office	2021-03-01	2022-12-15	Laura Becker
CGIAR Research Program on Livestock Agri-Food Systems	7,837,918	Ethiopia Morocco Tunisia		2017-01-01	2021-12-31	Barbara Rischkowsky

[7] Reflects the total grant amount awarded to the project, not the share specific to ICARDA Ethiopia operations

Project Title	Total grant value [7](USD)	Countries	Donor	Date from	Date to	Project Leader
CGIAR Research Program on Policies, Institutions, and Markets (PIM) - Phase II	675,144	Ethiopia Egypt China India Kenya Nepal Pakistan		2017-01-01	2021-12-31	Girma Tesfahun Kassie
CRP WHEAT Phase II	8,154,475			2017-01-01	2022-12-31	Michael Baum
Upscaling of Small Ruminant Community-Based Breading Program in Ethiopia	556,000	Ethiopia		2018-07-08	2022-06-30	Aynalem Haile
Services related to ACIAR project "Faba Bean in Ethiopia - Mitigating Disease Constraints to Improve Productivity and Sustainability	240,000	Ethiopia	UWA, ACIAR	2018-12-01	2023-06-30	Seid Ahmed Kemal
Protecting Ethiopian Lentil Crops	1,556,000	Ethiopia	UWA, ACIAR	2021-07-01	2026-06-30	Seid Ahmed Kemal
Green Innovation Centers: Promoting Climate-resilient Legume Value Chain Systems in Ethiopia	300,363	Ethiopia		2020-12-01	2023-11-30	Seid Ahmed Kemal
Durum wheat genetic resources can help mitigate negative impact of climate change in Ethiopia, and beyond, though developing its climate-resilient cultivars	300,000	Ethiopia	SLU	2021-01-01	2023-12-31	Zewdie Bishaw
Unlocking the Potential of Grass pea for Resilient Agriculture in Dry Environments (UPGRADE)	282,246	Ethiopia	JIC	2018-07-01	2022-06-30	Zewdie Bishaw

Project Title	Total grant value [7](USD)	Countries	Donor	Date from	Date to	Project Leader
Deployment of Malt Barley and Faba Bean Varieties and Technologies for Sustainable Food and Nutritional Security and Market Opportunities in the Highlands of Ethiopia	3,000,000	Ethiopia	USAID	2015-04-01	2018-06-30	Zewdie Bishaw
Better livelihoods for small holder farmers through knowledge-based technology interventions in the highlands of Ethiopia: Increasing the productivity of chickpea in wheat-based cropping system	1,670,000	Ethiopia	USAID	2015-04-01	2018-06-30	Zewdie Bishaw
Multinational – CGIAR Project: Support to Agricultural Research for Development of Strategic Crops in Africa (SARD-SC)	15,000,000	Ethiopia Kenya Lesotho Mali Mauritania Niger, Nigeria Tanzania Zambia Zimbabwe Sudan	AfDB	2012	2017	Solomon Assefa
Rapid Deployment of Rust Resistant Wheat Varieties for Achieving Food Security in Ethiopia	3,009,850	Ethiopia	USAID	2010-04-30	2014-12-30	Zewdie Bishaw