CGIAR Research Program on Agriculture for Nutrition and Health (A4NH)
In 2021, 12 CGIAR Research Programs (CRPs) and four CGIAR Platforms came to a close. This summary report presents an overview of the work of the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH) between 2017 and 2021 and highlights its key achievements over this five-year period.
Overview

A4NH was one of four cross-cutting Global Integrating Programs in CGIAR’s 2017–2021 portfolio. By focusing on consumption and demand, A4NH sought to realize the enormous potential of agricultural development to contribute significantly to improving the nutrition and health of people worldwide.

The CGIAR Strategy and Results Framework 2016–2030 reflected the importance of agriculture to support better nutrition and health, and formed the basis of research program design for the 2017–2021 portfolio. A4NH was designed to fill the gap between agricultural development and its unfulfilled potential to benefit health and nutrition. Hunger, malnutrition, and poor health are widespread and stubborn development challenges. Although remarkable advances in agriculture have occurred in past decades, progress has lagged in improving the nutrition and health of poor farmers and consumers in low- and middle-income countries (LMICs).

A4NH worked in two phases from 2012 to 2016 and from 2017 to 2021. During Phase II, A4NH worked across five flagships: food systems for healthier diets; biofortification; food safety; supporting policies and programs, and enabling action through research; and improving human health. A4NH worked to strengthen CGIAR’s contribution to nutrition and health outcomes through joint research with other CRPs, particularly in a subset of priority countries identified by CGIAR. A4NH also engaged in networking and mutual learning with other CRPs and partners, and helped to bridge the space between CGIAR and the nutrition and health research, development, and policy communities.

A4NH’s five flagships worked closely with three cross-cutting units: gender, equity, and empowerment; country coordination and engagement; and monitoring, evaluation, and learning. Research focused on Bangladesh, Ethiopia, India, Nigeria, and Vietnam, with work extending to more than two dozen other countries.
From 2017-2021, A4NH worked primarily in East and Southern Africa (25%), West and Central Africa (16%), and South Asia (13%). In addition, 11% of A4NH’s work was global and 6% was regional.
Between 2017 and 2021, A4NH reported contributions to 11 of the United Nations’ Sustainable Development Goals (SDGs), with the most contributions tagged to SDG2, zero hunger (23%), followed by SDG12, responsible production and consumption (21%), and SDG17, partnerships for the goals (16%) (Figure 2).

Overall, A4NH reported 13 contributions to the system level outcomes (SLOs) set out in the CGIAR Strategy and Results Framework 2016–2030. A4NH reported seven contributions to SLO1, reducing poverty, and six contributions to SLO2, improving food and nutrition security for health (Figure 3). These contributions were related to the development of and access to biofortified planting material for millions of people, and the wide-scare use of Aflasafe, a natural biocontrol agent that reduces aflatoxins in crops.

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1The content in this section is drawn from the A4NH Annual Reports, which are included in the Resource section of this Summary Report. The complete list of A4NH achievements can be found on the CGIAR Results Dashboard.
Examples of A4NH achievements:

**Biofortification:**
Between 2017 and 2021, A4NH successfully increased access to biofortified crops. During this period, the CRP reached nearly 8.5 million farming households with biofortified planting material, and an estimated 12.8 million households (approximately 64 million people) grew and consumed biofortified crops.

**Aflasafe:**
A4NH was involved in the development and production of Aflasafe, a technology to limit the contamination of staple crops with aflatoxins. By 2021, more than 300,000 farm households used 5,400 tons of Aflasafe to produce approximately 1 million tons of aflatoxin-safe crops, mainly maize and groundnut.

**Human health**
Even before the onset of the COVID-19 pandemic, A4NH was actively gathering evidence on and providing solutions to health risks associated with the management of zoonoses and antimicrobial resistance (AMR). To do so, A4NH researchers applied a One Health approach that considers the connections between human, animal, and environmental health.

A4NH researchers developed methods to better predict Rift Valley fever outbreaks and identified ways to reduce human exposure to disease by documenting hygiene practices in slaughterhouses in Kenya. A4NH researchers also developed ways to manage the spread of cysticercosis — a parasitic disease of pigs that can infect humans, causing epilepsy — through interventions to reduce the parasite burden in pigs, treat infected humans, and improve hygiene to reduce transmission.

In 2019, the CGIAR Antimicrobial Resistance Hub was launched, which supported the efforts of LMICs to control agriculture-related AMR risks by applying a One Health approach.

In July 2020, CGIAR established a COVID-19 Hub that was hosted by A4NH. The Hub focused on addressing value chain fractures, integrating a One Health approach to COVID-19 responses, supporting country-specific responses to the pandemic, and addressing food system fragilities. This work built on in-country partnerships and skills to deliver context-specific and demand-driven food system interventions.
Achievements Cont’d

**GENDER**

In 2017, A4NH published the Reach, Benefit, Empower (RBE) framework (now known as the Reach-Benefit-Empower-Transform [RBET]) framework to help distinguish between approaches that “reach” women as participants, those that actually “benefit” women, and those that “empower” women. A4NH was also involved in the second phase of the Gender, Agriculture, and Assets Project (GAAP2).

Researchers developed a project-level Women’s Empowerment in Agriculture Index (pro-WEAI) to measure women’s empowerment and inclusion in agricultural development projects. The pro-WEAI helps assess women’s empowerment in an agricultural development project setting, diagnose areas of disempowerment, design strategies to address deficiencies, and monitor and evaluate project outcomes.

In 2021, applications of the pro-WEAI continued to expand. Findings from three studies in Bangladesh and India showed that the pro-WEAI was useful in detecting changes in empowerment indicators during the lifespan of a project. In response to growing demand, A4NH researchers developed a distance learning course to teach skills specific to the WEAI and the pro-WEAI. Pro-WEAI for Market Inclusion (pro-WEAI+MI), a metric developed to measure women’s and men’s absolute and relative empowerment along value chains, was applied in Bangladesh, the Philippines, Benin, and Malawi.

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2 For the complete list of gender achievements, refer to the A4NH Annual Reports included in the Resource section of this Summary Report.
Key Challenges and Risks during Implementation of A4NH³

**KEY CHALLENGES**

*Variance from planned programs and activities*

Throughout the course of the program, A4NH reassessed its priorities and focus as a result of changing circumstances, opportunities, and challenges. Notable adjustments and pivots included:

- Expanding research on food systems to include work on diagnostics and foresight, and increasing focus on urban food systems and national food system assessments beyond A4NH focal countries.
- Investing in and increasing research on food safety, including in informal or traditional markets.
- Increasing opportunities for contributions and technical inputs to work on AMR and antimicrobial use.
- Expanding the portfolio of food price research.
- For work on biofortification, shifting the focus from delivering biofortified varieties and products to supporting actors in scaling biofortification.
- Shifting the focus of work on Aflasafe from generating evidence to scaling.
- As a result of the COVID-19 pandemic, expanding partnerships on One Health, particularly with the environmental sector. Efforts were made to accelerate work that reduces risks from zoonotic diseases and AMR. A4NH also made a considerable shift to support COVID-19 responses across CGIAR, given A4NH’s capacity in One Health and food systems.

³ The content in this section is drawn from the A4NH Annual Reports, which are included in the Resource section of this Summary Report. These Reports contain a complete list of challenges and risks.
Key Challenges and Risks during Implementation of A4NH³

Cont’d

MANAGEMENT OF RISKS

Institutional risks

• Mitigation of individual and collective risks. A4NH worked with its managing partners and established a multi-institutional management arrangement with clear roles, responsibilities, authority, and accountability for all seven managing partners. A4NH leveraged resources and tapped into partnerships over the course of Phase II to provide support for country coordination in five focus countries and to successfully manage both the CGIAR AMR Hub and the CGIAR COVID-19 Hub.

Programmatic risks

• Transition to One CGIAR. A4NH consolidated and aligned research with future CGIAR research modalities. To support research continuity, the CRP consolidated lessons and evidence into a series of strategic briefs, curated an online resource center for methods and tools, and completed a set of synthesis studies.

Contextual risks

• Partnerships. The focus country teams played a critical role in engaging with national partners to understand their perspectives and manage expectations. Given its cross-sectoral nature, many of A4NH’s nutrition and health partners were relatively new and unique to CGIAR and the One CGIAR transition posed a risk to these partnerships at multiple levels. A4NH helped to facilitate the engagement of key nutrition and health partners in the One CGIAR change process.

• COVID-19. The pandemic further delayed implementation in 2021. To mitigate risks, engagement activities and fieldwork were either postponed or completed remotely (virtually or by phone).

³ The content in this section is drawn from the A4NH Annual Reports, which are included in the Resource section of this Summary Report. These Reports contain a complete list of challenges and risks.
1. SPHERE OF CONTROL

Outputs

- **1,000,617** People Trained
- **496,808** People Trained
- **503,809** People Trained

2. SPHERE OF INFLUENCE

Outcomes

- **347** Innovations
- **149** Milestones
- **48** OICRs

3. SPHERE OF INTEREST

Impact

- **81** Policies
- **11 SLOs** Contributions
- **13 SDGs** Contributions

**Contributions:**
- SLOs
- SDGs

**SLOs**
- **SUSTAINABLE DEVELOPMENT GOALS**

**Total Information Products with Altmetric Attention Score**

- **1122** Total Information Products

**Partnerships**

- **87** Partnerships

The figures in this report reflect reporting valid as of July 22, 2022.
Knowledge of brucellosis epidemiology supports the development of a national brucellosis strategy to support 45 million Kenyans – 2017

After years of integrated field research and advocacy by CGIAR and partners, the Government of Kenya prioritized brucellosis for government attention and finalized a draft National Strategy for Brucellosis. The national strategy combined health and livestock sector policies for brucellosis surveillance and implemented control by government administrations, public and private sector hospitals, and nongovernmental organizations (NGOs).

Busia County Biodiversity Policy (Kenya) recognizes the importance of native species for nutrition and food security and allocates resources for the conservation of regional food biodiversity – 2018

In Kenya, innovative multi-sectoral policy platforms supported by CGIAR and partners brought together the environment, agriculture and health sectors. In Busia County, a multi-disciplinary team of farmer organizations, NGOs, and national and international government agencies successfully promoted best practices and pilot programs to support biodiversity.

This initiative led to increasing interest in nutritious leafy vegetables and the piloting of a food procurement approach that links local producers to schools and health clinics. In addition, the County endorsed a first-of-its-kind biodiversity conservation policy that recognizes the benefits of underutilized crops and allocates resources to conserve and promote regional agrobiodiversity.

The Indian Council of Agricultural Research establishes minimum levels of iron and zinc in pearl millet – 2018

Informed by joint research with CGIAR, the Indian Council of Agriculture Research established minimum levels of iron and zinc for their pearl millet breeding program in 2018. As a result, all future releases of pearl millet varieties in India will be more nutritious, and iron and zinc intake will improve among pearl millet-consuming populations.

Nutrition research showed that consumption of iron-biofortified crops can improve iron deficiency and cognitive and physical

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4 The content in this section is drawn from the A4NH Annual Reports, which are included in the Resource section of this Summary Report.

5 Brucellosis is an infectious disease caused by bacteria, which is spread to humans through contact with infected animals or animal products contaminated with the bacteria. Commonly infected animals include sheep, cattle, goats, pigs, and dogs, among others.
function, and that consumption of zinc-biofortified crops can improve morbidity outcomes for women and children.

**Innovative delivery models for iron beans result in adoption by an estimated 442,000 households in Rwanda – 2019**

Starting in 2010, A4NH and the Rwanda Agricultural Board (RAB) managed a successful iron bean delivery program in Rwanda. Iron bean yields are about 20% higher than other beans, and the iron bean program generated USD$25 million in benefits from 2010–2018. By the end of 2018, around 442,000 households were growing iron beans, with 15% of the population (1.8 million beneficiaries) consuming them.

Evidence showed that the program not only reversed iron deficiency anemia but also improved health outcomes, such as cognitive and physical functions and productivity. In 2019, A4NH co-established a platform with RAB to further scale delivery before transferring the program to RAB.

**Development programs use A4NH tools to design, implement, and evaluate nutrition-sensitive agricultural programs seeking to empower women – 2021**

In 2021, A4NH commissioned an external evaluation to better understand awareness and use of the project-level Women’s Empowerment in Agriculture Index (pro-WEAI) and the Reach, Benefit, Empower, Transform (R BET) framework among a target population of potential users. The evaluation found that even though the tools are still relatively new, the influence has been significant. At least 48 projects are using pro-WEAI in evaluations, leveraging US$2.4 billion and reaching 10.5 million people.

**Biofortification mainstreamed into national breeding programs in Bangladesh, India, and Rwanda through partnerships between HarvestPlus and National Agricultural Research and Extension Systems (NARES) – 2021**

Starting in the late 1990s, CGIAR began exploring the potential of breeding to increase the micronutrient concentration in staple crops (aka biofortification) as a way to reduce micronutrient malnutrition. Most of this work took place under HarvestPlus. An external study commissioned by A4NH in 2021 looked at lessons learned from HarvestPlus’ work with National Agricultural Research and Extension Systems (NARES) to develop and implement sustainable biofortification breeding programs, specifically for zinc rice in Bangladesh, iron beans in Rwanda, and iron pearl millet in India.

The study concluded that functioning breeding programs were in place and had good potential to be sustainable in all three cases. The programs have been successful in reaching hundreds of thousands to millions of farmers. It is highly unlikely that the programs would have been established without HarvestPlus as a driving force behind their establishment and implementation.

The complete list of reported A4NH impacts can be found on the CGIAR Results Dashboard.
From 2017–2021, A4NH had $358.44 million in total funding. Over this period, Windows 1&2 represented 27% of funding, Window 3 represented 43%, Bilateral represented 30%, and Center funds represented 1% (Figure 4).

The CRP’s top funder (Figure 5) was the CGIAR Trust Fund Windows 1&2, followed by the Bill & Melinda Gates Foundation, the United Kingdom, and the United States. A4NH was primarily implemented by IFPRI, with participation from all of CGIAR’s Centers (Figure 6).

5 The content in this section is drawn from CGIAR’s annual Finance Reports.
IN 2020, THE CGIAR ADVISORY SERVICES (CAS) SECRETARIAT EVALUATION FUNCTION COORDINATED INDEPENDENT EVALUATIVE REVIEWS OF EACH OF THE 12 CRPS. BELOW IS A SELECTION OF KEY FINDINGS FROM THE A4NH REVIEW.

Quality of science
The quality of A4NH science was reflected in the prevalence of A4NH publications appearing in high-impact journals across a broad set of disciplines. The vast majority of published research was relevant to the core program objectives, with high-impact contributions made by all flagships. Most published research demonstrated international collaborations with advanced research institutions and country partners. A4NH researchers were productive in terms of journal article publication and impact, and diverse in terms of disciplinary affiliation and gender. External institutional partnerships broadened the scope of research in A4NH and brought about meaningful program collaborations.

Importance of outputs and outcomes
Substantial progress was made in farm households’ adoption of biofortified varieties (and associated reductions in micronutrient deficiencies). However, improving dietary diversity proved more challenging. A4NH produced important global public goods with health and nutrition benefits. In many cases, A4NH impact was achieved through tools or methods applied by next-stage users to improve programs or policies. A4NH succeeded in influencing nutrition and health policies and investments at global, regional, and national levels.

Mechanisms for achieving sustainability
A4NH made real progress in bringing a nutrition and health focus to CGIAR. As a result of the work of A4NH, CGIAR is now engaged with and recognized by a wider audience in nutrition and health. While COVID-19 delayed progress in some areas, the pandemic also revealed the relevance of A4NH research to a One Health approach and demonstrated why One Health will be an important part of CGIAR research moving forward.

The work of A4NH demonstrated a need to maintain a deliberate focus on nutrition and health in new research modalities. This has been recognized in the new CGIAR 2030 Research and Innovation Strategy, with one of the CGIAR Impact Areas dedicated to nutrition, health, and food security. Fourteen CGIAR Initiatives within the new portfolio are directly relevant to this Impact Area, including an Initiative on sustainable healthy diets through food systems transformation and another Initiative on protecting human health through a One Health approach. The food systems approach in nutrition is gaining momentum worldwide, and the legacy of A4NH is reflected in CGIAR’s continued prioritization of nutrition and health.
Resources

A4NH Annual Report 2017
A4NH Annual Report 2018
A4NH Annual Report 2019
A4NH Annual Report 2020
A4NH Annual Report 2021

CGIAR Annual Performance Report 2017
CGIAR Annual Performance Report 2018
CGIAR Annual Performance Report 2019
CGIAR Annual Performance Report 2020
CGIAR Annual Performance Report 2021

CGIAR RESULTS DASHBOARD
CGIAR FINANCIAL REPORT DASHBOARDS