



RESEARCH  
PROGRAM ON  
Agriculture for  
Nutrition  
and Health

Led by IFPRI

# 2021

## ANNUAL REPORT

To the CGIAR System Organization



A4NH is led by the International Food Policy Research Institute (IFPRI) and managed along with The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT), the International Institute of Tropical Agriculture (IITA), the International Livestock Research Institute (ILRI), the London School of Hygiene and Tropical Medicine (LSHTM), and Wageningen University and Research (WUR).

Our five flagships are led by: Wageningen University and Research (Flagship 1); the HarvestPlus program of IFPRI (Flagship 2); the International Livestock Research Institute (Flagship 3); the International Food Policy Research Institute (Flagship 4); and the International Livestock Research Institute and the London School of Hygiene and Tropical Medicine (Flagship 5).

Alliance



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## Acronyms and Abbreviations

A4NH	Agriculture for Nutrition and Health
AMR	Antimicrobial resistance
ANH Academy	Agriculture, Nutrition, and Health Academy
ASF	Animal source foods
AST	Antimicrobial susceptibility testing
AWD	Alternate wetting and drying
AU	African Union
CIAT	International Center for Tropical Agriculture
CIP	International Potato Center
CFS	Committee on World Food Security
COVID-19	Coronavirus disease of 2019
CRP	CGIAR research program
DALYs	Disability adjusted life years
EAC	East African Community
FAO	Food and Agricultural Organization of the United Nations
FP	Flagship
GAAP2	Gender, Agriculture, and Assets Project, Phase 2
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IWMI	International Water Management Institute
LSHTM	London School of Hygiene & Tropical Medicine
MOOC	Massive open online course
NCD	Non-communicable disease
OHRECA	One Health Research, Education and Outreach Centre
OSP	Orange sweet potato
PIM	Policies, Institutions, and Markets
PMU	Program management unit
Pro-WEAI	Project-level Women's Empowerment in Agriculture Index
Pro-WEAI+MI	Project-level Women's Empowerment in Agriculture Index for market inclusion
RBE	Reach, Benefit, Empower
RVF	Rift Valley fever
SARS-CoV-2	Severe acute respiratory syndrome coronavirus 2
SLO	System level outcome
UNFSS	United Nations Food Systems Summit
W1/W2	Window 1/Window 2
WEAI	Women's Empowerment in Agriculture Index
WUR	Wageningen University and Research

## Executive Summary

The CGIAR Research Program on Agriculture for Nutrition and Health (A4NH) seeks to realize the potential of agricultural development to make significant contributions to improving the nutrition and health of people worldwide. A4NH is led by the International Food Policy Research Institute (IFPRI) and managed by four other CGIAR Centers: The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT), the International Institute of Tropical Agriculture (IITA), and the International Livestock Research Institute (ILRI); and two academic institutions: the London School of Hygiene & Tropical Medicine (LSHTM) and Wageningen University and Research (WUR). Some 2021 highlights that you will read about in this report include:

### **Evidence-based contributions to programs and policies**

- The United Nations Food Systems Summit process helped Member States to develop food systems transformation pathways. A4NH resources – national food systems profiles, an online food systems innovations evidence map, and numerous publications – informed the National Dialogues in Ethiopia and Viet Nam, in particular, as well as specific action areas, solution clusters, and coalitions.
- Member States of the Committee on World Food Security (CFS) approved the new Voluntary Guidelines on Food Systems and Nutrition. As a member of CFS, CGIAR participated in their development. A CGIAR-specific platform that links recommended actions to relevant A4NH-generated knowledge and a set of policy briefs to provide evidence-based recommendations for operationalizing the Guidelines into policies and programs will be launched in 2022.
- An external evaluation concluded that at least 48 agricultural development projects were known to be using the project-level Women's Empowerment in Agriculture Index (pro-WEAI) in evaluations, leveraging US\$2.4 billion and reaching 10.5 million people.

### **Progress in scaling innovations with partners**

- To date, 414 biofortified varieties of 12 staple crops have been approved for planting. In 2021, an estimated 12.8 million households were growing and consuming biofortified crops in Africa, Asia, and Latin America.
- By the end of 2021, 14 Aflasafe products were registered for use in 10 countries in sub-Saharan Africa. Through IITA-led projects and initiatives, at least 57 public sector agencies and agribusinesses have adopted aflatoxin mitigation technologies such as Aflasafe.

### **Partnerships to support science and scaling**

- AflaLivre Moçambique S.A. was licensed to manufacture and distribute Aflasafe in Mozambique. The Aflasafe manufacturing facility in Nampula is expected to be operational by June 2022 and will be the fifth active private sector actor in sub-Saharan Africa manufacturing and distributing Aflasafe products.
- CGIAR researchers continued supporting the African Union in the development, implementation, and validation of their Food Safety Strategy for Africa and the Africa Food Safety Index.

### **Raising awareness and building capacity**

- A4NH researchers with two French public research institutes co-designed a mini-massive open online course (MOOC) on food environments for healthy sustainable diets. Three courses were held in 2021 with 1000 people in the first cohort.
- In response to growing demand, A4NH researchers developed a distance learning course for researchers and practitioners on the pro-WEAI tool, from its background to its practical application within the project context, all based on real-world experiences from the team that developed it.

# 1. Key Results

## 1.1 Progress towards SDGs and SLOs

The CGIAR Research Program (CRP) on Agriculture for Nutrition and Health (A4NH) seeks to realize the potential of agricultural development to make significant contributions to improving the nutrition and health of people worldwide. A4NH is led by the International Food Policy Research Institute (IFPRI) and managed by four other CGIAR Centers: The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT), the International Institute of Tropical Agriculture (IITA), and the International Livestock Research Institute (ILRI); and two academic institutions: the London School of Hygiene & Tropical Medicine (LSHTM) and Wageningen University and Research (WUR).

As CGIAR's only research program on nutrition and health, A4NH research contributes to the system-level outcome (SLO) on food and nutrition security for health. Our 2021 contributions to the SLO targets from adoption and impact data are summarized and described below.

- As a result of HarvestPlus delivery efforts, nearly 8.5 million farming households were reached with biofortified planting material and an estimated 12.8 million households, (translating to an estimated 64 million people) were growing and consuming biofortified crops. In 2021, 21 new biofortified crop varieties were released, bringing the total number of releases through HarvestPlus efforts to 283 varieties of 12 crops, across 30 countries (with 30 additional countries in testing phase). When vitamin A-enriched orange sweetpotato (OSP) varieties released through the International Potato Center (CIP) are included, this figure increases to 414 biofortified varieties.

The 12.8 million households *growing* and *consuming* biofortified crops is an underestimate. In addition to the households *growing* biofortified crops, there were increased sales of biofortified products in 2021. It is likely that more people are *consuming* biofortified products through the market and therefore more people with reduced micronutrient deficiencies than have been accounted for in the latest data from the Global Households Reached Projection Model.

- Up to 2021, more than 300,000 farm households used 5,400 tons of Aflasafe to produce ~1 million tons of aflatoxin-safe crops, mainly maize and groundnut. A mix of public and private sector partners and IITA manage the production, distribution, and correct usage of Aflasafe.

These crops entered both formal and informal markets and benefitted millions of consumers and industries in at least 11 African countries. Based on current estimates, the quantity of aflatoxin-reduced crops produced through 2021 was enough to feed 100 million people with 100 days of aflatoxin-safe rations.

## 1.2 A4NH Progress towards Outputs and Outcomes

### 1.2.1 Overall A4NH Progress

A4NH seeks to realize the potential of agricultural development to contribute to improved nutrition and health of people worldwide. A4NH research is conducted in five flagships (FPs), or program areas. Three cross-cutting units help to catalyze research outputs into development outcomes and impact. A4NH places emphasis on aligning with country partners, particularly in five focus countries (Bangladesh, Ethiopia, India, Nigeria, and Viet Nam).

## 1.2.2a Progress by Flagships

### FP1 – Food Systems for Healthier Diets

- The United Nations Food Systems Summit (UNFSS) process, in particular, the national Dialogues helped Member States to develop pathways towards sustainable food systems. FP1 resources, such as the national food system profiles, an [evidence map](#) on food systems innovations, and [numerous publications](#) contributed to the Dialogues, specific action tracks, and solution clusters.
- Funders used evidence and insights generated by FP1 in their operational and investment decisions. A [multi-country study on fruits and vegetables](#) shaped priorities for a new, multilateral initiative. FP1 research featured prominently in the International Fund for Agricultural Development's 2021 Rural Development Report on [Transforming Food Systems for Rural Prosperity](#).
- Targeted investment in 2020-2021 to synthesis FP1 work resulted in studies on: lessons learnt from the [focus country food policy baseline studies](#); [opportunities for accelerating food systems innovations](#); and the [role of the private sector](#) in food system transformation processes in low- and middle-income countries.
- Reliable data, evidence, and insights generated by FP1 researchers expanded the content offered by the [Food Systems Resource Center](#). The Food Systems Idea Exchange published numerous blogs on timely issues pertaining to [accountability following the UNFSS](#), [gender equity in the food environment](#), and results from experiments to lower the [price of healthy foods](#).

### FP2 – Biofortification

- Critical FP2-funded studies were published showing the impact of biofortification on functional and health outcomes. For example, consumption of [Vitamin A maize](#) by breastfeeding women in Zambia improved milk retinol concentration; consuming [iron pearl millet](#) increased light physical activity and decreased sedentary time in Indian schoolchildren in a dose-dependent manner; and a meta-analysis that concluded that low-dose, long-duration [zinc intake from biofortification](#) could potentially mitigate risk factors for non-communicable diseases (NCDs).
- High-yielding micronutrient enhanced varieties moved towards delivery at scale in priority countries. [Lessons learned from the HarvestPlus experience](#) were published to illustrate the need for context-specific, innovative solutions to promote widespread adoption and more evidence on [iron bean adoption](#) provided evidence that biofortified crops are an effective investment for nutrition.
- Several tools were made publicly available to mobilize biofortification knowledge and help inform scaling. These tools include the updated [Biofortification Priority Index](#), a biofortified crop app, e-library, and map of biofortification policies.
- A [call to action](#), prepared by FP2 researchers for the UNFSS processes and the Tokyo Nutrition for Growth Summit, drew attention to the opportunity for stakeholders to include biofortification in their investments, decisions, pathways to foster resilient, inclusive and nutritious diets and food systems.



### FP3 – Food Safety

- As part of the UNFSS, FP3 researchers helped co-lead the development of two game-changing sets of solutions (for [Action Track 1](#)) and the building of an emerging partnership of public sector, private sector, and civil society.
- Researchers finished testing a combined intervention to improve food safety in informal markets, known as the ‘three-legged stool approach’ in six countries. The Government of Cambodia is expected to [scale the intervention in local markets](#) in coordination with local partners.
- A series of experiments in Uganda and Viet Nam continued to test nudges for food safety. Researchers developed a [handbook for pork retailers in Viet Nam](#) to use in the design, implementation, and evaluation of food safety nudges.
- By the end of 2021, [14 Aflasafe products](#) were registered for use in 10 countries in Africa. Products are registered for use in maize, plus with variations by country, also in groundnut and sorghum. Products for use in Rwanda and Mali reached advanced stages in the registration pipeline.
- New agreements for the manufacturing and distribution of [Aflasafe in Mozambique](#) were made with AflaLivre Moçambique. New agreements were made for Aflasafe distribution in Mali with [UPL-MPC](#) and in Ghana with UPL-Callighana, subsidiaries of the UPL Limited Group.

### FP4 – Supporting Policies, Programs, and Enabling Action through Research

- Several studies were published, building the evidence base on the contribution of agriculture and other sectors to improve nutrition. A study from Malawi concluded that cost per beneficiary estimates of implementing an integrated agriculture–nutrition intervention through an [early childhood development platform](#) compared favorably with similar interventions and could be an [efficient use of resources](#) in contexts similar to Malawi’s. From India, a qualitative study examined the barriers and facilitators to [leveraging data to improve maternal nutrition program delivery and reach](#); from Burundi, findings suggest that [food assistance programs](#) in highly food-insecure regions can protect the most disadvantaged children from wasting.
- Transform Nutrition West Africa ended in 2021, wrapping up four years of [regional policymaker engagement](#) to generate and mobilize nutrition knowledge and strengthen the enabling environment in West Africa.
- The Committee on World Food Security (CFS) Members endorsed new [Voluntary Guidelines on Food Systems and Nutrition](#). A4NH participated in the development and has supported efforts with the Food and Agriculture Organization of the United Nations (FAO) to map A4NH evidence that will [help countries with implementation](#). A set of briefs outlining evidence-based recommendations from A4NH for operationalizing the Guidelines will be finalized in 2022.

### FP5 – Improving Human Health

- A systematic review by FP5 confirmed that in Africa, [irrigated rice is associated with more malaria](#) in local residents. Field studies from Côte d’Ivoire suggest that integrated methods, including alternate wetting and drying (AWD) irrigation, can suppress the production of both mosquitoes and greenhouse gases in irrigated rice fields.
- The Ugandan Ministry of Agriculture, Animal Industry and Fisheries and Vétérinaires sans Frontières Germany have been using Rift Valley fever (RVF) risk maps, co-developed by FP5 researchers, as part of their RVF participatory surveillance activities in livestock.
- In Kenya, FP5 developed a mobile phone platform, supported by Safaricom, to help with coordination of [One Health efforts in pastoral regions](#), specifically in the sharing of information on disease outbreaks. With the national antimicrobial resistance (AMR) task force, FP5 researchers co-developed national surveillance policies and strategies for mitigating the development of AMR in poultry and dairy cows.

- A scoping review on the global incidence of [AMR in food crop environments](#) and value chains showed widespread resistance. The sheer scale of contamination, presence of AMR bacteria on foods likely to be eaten fresh, and the presence of resistance on plant foods to drugs of critical human importance, make this an important report.

## **1.2.2b Relevance to COVID-19 by Flagship**

### **FP1 – Food Systems for Healthier Diets**

- The evolving coronavirus disease of 2019 (COVID-19) pandemic and measures further delayed implementation in 2021. Fieldwork, especially related to testing food systems innovations, was either completed through phone surveys or re-started in 2021. Fortunately, data collection of almost all projects was completed before the end of A4NH. Again, like in 2020, while partners were restricted from traveling, local partners took responsibility for implementing fieldwork, with online or virtual support provided by FP1 researchers. Policy engagement activities in the four focus countries (Bangladesh, Ethiopia, Nigeria, and Viet Nam) were mostly postponed, but in a few exceptions virtual consultations were held with less impact than the face-to-face option.
- FP1's support to the understanding of impacts of COVID-19 on food systems and diets in the four focus countries continued in 2021 with follow-up surveys to understand the consequences of COVID-19 and its evolving measures on the outcomes of the different innovations being tested. A chapter in the *2021 Global Food Policy Report*, co-authored by FP1 and FP4, discussed the [consequences of COVID-19 on nutrition](#), asking for more attention to support governments to develop food-based dietary guidelines, more attention for nutrition-sensitive social safety nets and more emphasis on harnessing the influence of the food environment on consumer choices.

### **FP2 – Biofortification**

- Unfortunately, pandemic-related disruptions, particularly in India, stalled biofortification feeding trials and the related sample collection and laboratory testing. This was especially true for the Mumbai multiple biofortified crops study on women of child-bearing age, children 6-24 months of age and their lactating mothers. Several outcome monitoring and value chain actor assessment surveys had to be downsized and/or converted to phone surveys due to COVID-19 related restrictions.

### **FP3 – Food Safety**

- Although still largely restricted by the pandemic, in some countries FP3 researchers managed to resume or start fieldwork, albeit on an irregular basis depending on national and institutional policies. New studies on COVID-19 which started in 2020 continued.
- In Viet Nam, FP3 researchers evaluated the changes in accessibility and consumption of animal source foods (ASF) and changes in food safety practices and behavior of ASF retailers during and after the pandemic. The unpublished findings show that pork sale volume and chicken sale volume were both highest in rural areas. The pattern did not change among the period investigated (before, during and after COVID-19). Most retailers found it more difficult to source pork and chicken during the lockdown and this persisted through the time of the study. However, some retailers found it easier, perhaps because of less competition from other retailers who stopped working. Retailers' income decreased 60% during the lockdown period as compared to incomes before the pandemic; partial recovery was observed. Hygiene practices were improved by retailers during lockdown and were observed to being maintained during the study period.



- In Nairobi, the team explored how the welfare of informal dairy vendors and their customers changed as the pandemic began and as restrictions were implemented. Unpublished findings suggest that the COVID-19 pandemic in Kenya appears to have only marginally disrupted the operations and supply of dairy markets but seems to have decreased households' access to dairy. The potential negative effects on the nutritional status of low-income urban residents are of concern and the pathways for such impacts should be further investigated.
- Although not at the same pace due to COVID-19, Aflasafe commercial usage or effectiveness trials continued in 16 African countries. FP3 researchers traveled to assist partners in the Democratic Republic of Congo, Mozambique, Sudan, Kenya, Tanzania, and Nigeria.

#### **FP4 – Supporting Policies, Programs, and Enabling Action through Research**

- Fieldwork and in-person data collection paused for several FP4 program evaluations with some field activities resuming gradually while respecting public health safety standards.
- In a few cases, program evaluations used phone surveys to assess the socioeconomic and welfare impacts of COVID-19 and related lockdown measures. Continuing from 2020, two additional surveys were conducted related to the impact of COVID-19 on dairy production households in Kenya. In [Myanmar](#), researchers carried out monthly surveys to monitor the income, food insecurity and dietary impacts of the COVID-19 crisis and measure the short- and long-term welfare impacts of the pandemic. Results from similar phone surveys in [Bangladesh](#) and [India](#) were published in peer-reviewed journals, capturing the changes in health and nutrition service delivery and changes in utilization of these services in both urban and rural areas.
- A forward-looking collection in *Nature Food*, [Food Systems in the Wake of COVID-19](#), included two pieces co-authored by A4NH researchers. A [commentary](#) summarized how the pandemic has affected food and nutrition security and provided some specific recommendations on how to mitigate long-term effects of the pandemic on diets and nutrition. A second [article](#) presented three modelling scenarios to estimate the impacts of pandemic-induced disruptions on child stunting, wasting and mortality, maternal anemia and children born to women with a low body mass index (BMI) in 118 low- and middle-income countries. The authors also estimated the cost of six nutrition interventions to mitigate excess stunting and child mortality due to the pandemic. In the six months since publication, the article reached an exceptionally high Altmetric score of [558](#) and is considered in the top 5% of all research outputs scored by Altmetric.

#### **FP5 – Improving Human Health**

- Fieldwork was still largely restricted by the pandemic, but modifications were made as the local situation allowed to support adaptation of ongoing studies or the launch of new studies.
- Screening for COVID-19 exposure was incorporated into selected sero-epidemiological studies from FP5 to obtain more insights on the epidemiology of the disease. For example, a study in Kenya on RVF in humans and animals was amended to include screening for the virus that causes COVID-19, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), in samples collected from pastoralists and slaughterhouse workers in northern Kenya. The samples are currently being screened and results obtained will be published early 2022 after A4NH ends. ILRI researchers from FP5 continued to implement SARS-CoV-2 surveillance work to [support the Ministry of Health of Kenya](#), an initiative which started in 2020.
- FP5 researchers also launched sewage surveillance study in Nairobi to explore opportunities of using this approach to map risk. This might become an important tool as COVID-19 becomes endemic, and sometimes subclinical in vaccinated populations. Wastewater samples could also be screened for other pathogens, including AMR bacteria.
- The One Health Research, Education and Outreach Centre (OHRECA) supported two other activities on COVID B cell profiling in COVID-19 patients in Kenya to explore possibilities of

generating sera that can be used for passive treatment. Emerging infectious diseases is a thematic focus of OHRECA and this includes COVID-19 diagnostics and control and pandemic prevention.

### 1.2.3 Variance from Planned Program for this Year

#### (a) Have any promising research areas been significantly expanded?

- In FP1, a major piece of [research on fruits and vegetables](#) was completed in response to funder demands and will guide a major global initiative expected to start in 2022. A systematic review on indicators for consumer behavior and practices was completed for FAO. The Swiss Embassy expanded FP1's work with the Ethiopian Public Health Institute on the development of food-based dietary guidelines for pastoralist communities in Ethiopia and other areas in Africa, which will be finalized in early 2022.
- In FP2, research on zinc biofortification and its potential for reducing the risk of NCDs has been expanded following [a study](#) which estimated the proportion of NCD burden attributable to zinc deficiency and the disability adjusted life years (DALYs) lost to zinc deficiency related NCDs. In another area, HarvestPlus expanded its investment in surveys to understand the willingness, challenges and opportunities of value chain actors to "biofortify." With J-PAL, work began to assess the potential of various mechanisms for catalyzing scale.
- In FP5, ILRI with the Global Burden of Animal Diseases program launched a new collaboration to expand analyses of disease burden in studies that cover multiple pathogens.

#### (b) Have any research lines been dropped or significantly cut back?

- The research lines have remained consistent with what was outlined in A4NH's Full Proposal for Phase II.
- Due to competing bilateral program deliverables and requests, FP2 research on cost-effectiveness and *ex ante* impact analyses did not reach the level of maturity A4NH had hoped it would by the end of 2021.
- FP5 research in Phase II determined that irrigated rice contributes significantly to the burden of malaria in Africa. Field research demonstrated that it is feasible to develop rice-growing methods that simultaneously suppress the production of both mosquitoes and greenhouse gases, while maintaining yield. These important findings were featured in the [CGIAR Annual Performance Report 2020](#), but in the CGIAR transition, CGIAR has dropped this line of research and there is no place for it in any of the new initiatives.

#### (c) Have any Flagships or specific research areas changed direction?

Research topics and objectives remained consistent with what was outlined in A4NH's Full Proposal for Phase II.

## 1.3 Cross-cutting Dimensions

### 1.3.1 Gender

#### (a) List any important CRP research findings, methods or tools, capacity development, policy changes or outcomes in the reporting year related to gender issues.

- There was a lot of investment from A4NH to complete synthesis work on the project-level Women's Empowerment in Agriculture Index (pro-WEAI), as part of the wrap-up of the Gender, Agriculture, and Assets Project, Phase 2 (GAAP2), in 2021. Most projects were completed except

for two which have been delayed because of the pandemic. Findings from three studies in Bangladesh and India were published in a [special section of \*World Development\*](#). The studies demonstrated that the pro-WEAI was useful in detecting changes in empowerment indicators within the lifespan of a project.

- The applications of pro-WEAI in evaluation continued to expand. 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. The study adds to the literature on what factors are conducive to women's empowerment and gender equality within agricultural value chains.
- In response to growing demand, A4NH researchers from IFPRI, with support from the Bill & Melinda Gates Foundation, the United States Agency for International Development, and A4NH developed a distance learning course for the Women's Empowerment in Agriculture Index (WEAI) and the pro-WEAI. The online course is designed to meet the needs of a range of users by teaching specific skills related to the WEAI in an online learning environment. Digital certification is provided upon successful completion. To date, the pro-WEAI [Foundations Module](#) is available and the team intends to develop [five additional modules](#) which will become available in the coming years after A4NH ends.
- On the regional and global levels, A4NH researchers contributed to three UNFSS Gender Change Lever Regional Dialogues, including for [Africa](#), [Latin America and the Caribbean](#), and [South/Southeast Asia](#). They also contributed to the inaugural [2021 Global Food 50/50 Report](#), a joint initiative of Global Health 50/50 and IFPRI. The report reviews the gender- and equity-related policies and practices of 52 global food system organizations from the public, private, and not-for-profit sectors around the world. The report shows that organizational commitment to gender equality is high, but organizational leadership remains disproportionately male.
- Researchers across A4NH published results from several studies with gender and nutrition dimensions, including from Burkina Faso on the relationship between a nutrition-sensitive agricultural intervention and [women's and men's time use](#) and a [study on fruits and vegetables in seven countries](#) found that there are many obstacles for women to earn more money from the production, trade and processing of fruit and vegetables and these barriers are part of a wider problem of inequality facing women in agriculture.

**b) Mention any important findings that have influenced the direction of the CRP's work, and how things have changed.**

The IFPRI team continued a set of significant outreach and capacity development efforts for WEAI, pro-WEAI, pro-WEAI+MI, and many other adaptations. Methods and tools developed as part of A4NH are expected to be scaled across the new CGIAR initiatives through involvement and leadership in the CGIAR GENDER Platform.

**c) Have any problems arisen in relation to gender issues or integrating gender into the CRP's research?**

n/a

### 1.3.2 Youth and Other Aspects of Social Inclusion

**(a) List any important CRP research findings, methods or tools, capacity development, policy changes or outcomes in the reporting year related to youth and other aspects of social inclusion.**

- An examination of inequities in [changes in undernutrition across ethnic groups in Viet Nam](#) was published in *Food Security*. The authors find that despite a large set of policies designed to address

inequities, many central policies often do not consider the preferences or limitations of ethnic minority groups, and this has a negative influence on some identified determinants of malnutrition. This study was part of the [Stories of Change in Nutrition](#) project, which captured narratives of change in nutrition outcomes and policy processes in multiple countries.

- Building on work exploring school meals as a platform for improving child nutrition, a systematic review, key informant interviews and focus group discussions were conducted in two districts in Tanzania. The authors find that Tanzania lacks a clear policy on school feeding and there are no guidelines for school meal quality. Most critically, participation in school feeding programs is not mandatory, meaning that many students are left out and go hungry. They recommend that stakeholders consider implementing the [home-grown school feeding model](#) as a way to improve diversity of meals and their nutritional value and increase participation of communities and the inclusion of students.

**(b) Mention any important findings that have influenced the direction of the CRP's work, and how things have changed.**

As mentioned in prior annual reports, A4NH's work on equity, beyond gender equity, was slow in getting started during Phase II. Most findings were not available until 2020 and with the program ending in 2021, it was too late to make significant changes to or influence the direction of A4NH's work.

**d) Have any problems arisen in relation to youth issues or integrating youth into the CRP's research?**

n/a

**1.3.3 Capacity Development**

- A [mini-massive open online course \(MOOC\)](#) on food environments was co-developed by A4NH researchers from WUR with French public research institutes as part of a partnership launched in 2019 between CGIAR and the French government. The first cohort had more than 1000 people registered.
- A4NH researchers from ILRI are developing benchmarks that universities in East Africa can use to produce or upgrade curricula or modules on food safety. The starting point was a 2021 [review of relevant university courses](#), including an analysis of the gaps that would need to be filled to enrich and equip new professionals for the task. This long-term vision, already endorsed by the Inter-University Council of East Africa (IUCEA), is that improve curricula will strategically position the East African Community (EAC) member states to reap benefits from regional trade but also from the new Africa Continental Free Trade Area.
- A4NH researchers from IITA and WUR held a two-day master class for 34 members of active multi-stakeholder platforms in Nigeria on how to apply food systems thinking in practice.
- A4NH researchers from ILRI are using their lab resources in Nairobi to deliver microbiology and antimicrobial susceptibility testing training to staff from the Burundi Central Veterinary Laboratory.
- One of the primary objectives of OHRECA is to nurture future leaders in the regional One Health workforce through [graduate fellowship programs](#). OHRECA also strengthens national competencies in One Health through training programs and communication interventions for behavior change.

- A4NH researchers from IITA conducted online trainings for aflatoxin management for researchers in Togo and in person training for researchers in Sudan. Manufacturers and distributors across Africa received in-person training/assistance.

#### **1.3.4 Climate Change**

- With CCAFS, FP1 researchers from WUR have undertaken joint research on scenario-guided planning in Bangladesh. The results can be used to target and implement policy interventions for improving food and nutrition security under a changing climate. Modelling tools, databases and dashboards have been improved to reveal trade-off and synergy of carbon emissions and healthy diet outcomes in development paths at subnational level.
- Two external stakeholder audiences oriented towards climate action have been engaged in the development of storylines and priority setting for Bangladesh with A4NH and CCAFS: the Zero Hunger Zero Emission, a civil society driven network on climate action, and the Bangladesh Delta Plan, convened by the Planning Commission and Deltares to develop a long-term plan for the Delta region.

## **2. Effectiveness and Efficiency**

### **2.1 Management and Governance**

A4NH continued to benefit in 2021 from its clear governance and management structure, carefully described in the A4NH Governance and Management Handbook. Given the disruptions of 2020, particular care was taken in preparation of the 2021 Plan of Work and Budget to review all deliverables and to clarify work plan delivery and reporting requirements and timelines in the Program Participant Agreements with all Managing Partners. This has provided a strong anchor for ongoing follow-up on flagship performance given the ongoing disruptions due to COVID-19 and additional demands on key researchers and research leaders participating in the CGIAR transition.

As described last year, work progressed faster in countries with a strong core of national partners and slower when more complex multi-institutional networks were involved. As in 2020, the co-leadership and management of the CGIAR COVID-19 Hub put additional demands on the A4NH Director, key researchers, and members of the A4NH Program Management Unit. Contract management for multiple contracts with multiple Centers for the CGIAR COVID-19 Hub research funding was particularly resource intensive. A close partnership with the CGIAR System Office has been very productive at managing this additional cross-CGIAR responsibility.

### **2.2 Partnerships**

#### **2.2.1. Highlights of External Partnerships**

In 2021, A4NH's partnerships with food systems actors in its four focus countries was leveraged to support national transition pathways and follow-up relative to the UNFSS. The partnership was particularly influential in Ethiopia and Viet Nam. Partnerships with national food systems actors will continue and expand to some new countries as part of the new CGIAR initiative Sustainable Healthy Diets through Food Systems Transformation (SHiFT).

A4NH researchers from ILRI continued supporting the African Union (AU) in the development, implementation, and validation of the Africa Food Safety Index. The team has shared

recommendations, which were incorporated into an improved version of the index. Researchers also contributed to the development and validation of the [AU's Food Safety Strategy for Africa](#).

With Kenya's Ministry of Health, A4NH researchers from IFPRI and the University of Nairobi continued efforts to provide a more representative sample of aflatoxin risk in maize than has previously been available. This is part of ongoing contributions to Kenya's National Food Safety Surveillance Plan.

The Agriculture, Nutrition, and Health Academy (ANH Academy) brings together a network of 6000 researchers, practitioners and policymakers working at the intersection of agriculture, nutrition and health and has a major focus on supporting the next generation of researchers. The Academy is led by LSHTM, an A4NH managing partner. A4NH has been an important partner in the ANH Academy since its founding in 2016. We have provided support to the annual Academy week and led and participated in many Academy working groups. In 2021, A4NH co-organized with the ANH Academy a symposium reviewing the 10 years of A4NH entitled [Pathways to Progress: The Story of Agriculture for Nutrition and Health and What's Next](#).

### **2.2.2. Cross-CGIAR Partnerships**

With the CGIAR GENDER Platform, A4NH has co-created, consolidated and shared cutting-edge methods and tools that can help CGIAR, national agricultural research extension systems, universities and non-governmental organizations achieve gender equality outcomes. Its two goals are to enable critical discussion, reflection, development and dissemination of gender research methods as well as to strengthen and facilitate the use of methods, tools and standards for integrating gender research across CGIAR.

A4NH was asked by the CGIAR System Office to co-lead the CGIAR COVID-19 Hub. Much of the Hub's research has looked at the consequences and adaptation of food systems and agriculture due to COVID-19. There is also an expanded area of work on One Health, which has more systematically assessed the linkages between forest communities, wildlife, domestic animals and fresh food markets for COVID-19 and other emerging pathogens. This work can be built on in future work on pandemic preparedness.

Supported by A4NH and led by ILRI, the CGIAR AMR Hub has provided a research platform for IFPRI, ILRI, the International Water Management Institute (IWMI), and WorldFish to work together on AMR and connect with key partners of these Centers, most notably LSHTM and the Swedish University of Agricultural Sciences. Beyond research, the AMR Hub established testing platforms and co-led capacity development activities with country partners.

With AfricaRice, FP5 researchers from LSHTM have conducted fieldwork on morphological and molecular species identification of mosquitoes collected from trials after each rice season in West Africa. With CIP and PIM, HarvestPlus was able to conduct new research in two areas: an evaluation of vegetatively propagated biofortified seed systems and an ex-ante analysis and cost per disability adjusted life years (DALYs) saved for OSP programs using a HarvestPlus model, as part of PIM's Seed Systems and Markets Project.

## **2.3 Intellectual Assets**

A4NH's intellectual assets are largely knowledge and information products that are open access. Intellectual assets associated with new varieties and germplasm for biofortified varieties are the responsibility of the CGIAR Center involved in developing them.



## 2.4 Monitoring, Evaluation, Impact Assessment and Learning

In 2020, A4NH identified a set of high priority studies that would synthesize A4NH research and implications for the design of future research in CGIAR. These studies were completed in 2021.

One review analyzed the [role of the private sector in food system transformation](#). Only a few private sector studies seriously addressed trade-offs for food systems change. Much attention was given to opportunities for better bilateral linkages with supplier or consumer segments of the supply chain. Depending on the barriers or catalysts for influencing food systems outcomes, the authors discussed several potential strategies for increasing societal impact of private food sector activities.

Two key outputs of GAAP2 are pro-WEAI and the Reach, Benefit, Empower (RBE) framework, now known as Reach, Benefit, Empower, Transform (RBET). In this [evaluation](#), an e-survey was used to get a sense of awareness and use of the tools among a target population of potential users. Interviews were conducted to understand how tools were used at different stages of the program/project cycle. The evaluation found that even though the tools are relatively new, their use in projects is growing and they have contributed to changes in project priorities and in how projects seeking to empower women are designed and evaluated.

## 2.5 Efficiency

A4NH has been designed as a multi-institutional partnership with clear roles, responsibilities, authority, and accountability for the six Managing Partners and IFPRI, as the Lead Center. A4NH leveraged resources from several Managing Partners over the course of Phase II to provide support for country coordination in five focus countries. In addition, to successfully manage both the CGIAR AMR Hub and the CGIAR COVID-19 Hub, A4NH has leveraged resources and tapped into partnerships. This approach has important advantages that could be understood as lessons learned as CGIAR transitions from the current modalities of CRPs into the new initiatives.

In 2021, a programmatic focus for A4NH was to complete a series of synthesis studies – a mix of evaluations and reviews – that provide lessons and evidence from A4NH research and speak to two big questions - *how can A4NH approaches help new CGIAR research deliver impacts for all* and *how can A4NH evidence be embedded into new CGIAR research on securing public health*. Most of the studies were completed through consultancies, managed by the A4NH Program Manager, rather than asking A4NH researchers to take on something new while wrapping up their CRP commitments and, in many cases, while also designing new initiatives. This mechanism ensured that nearly all the studies and reviews were completed on-time and were of a quality that could be useful in future CGIAR research.

## 2.6 Management of Risks to A4NH

In 2020, A4NH planned how it could support the CGIAR transition given the expected central role of nutrition and health outcomes in future CGIAR research. As per the 2020 analysis, the key institutional, programmatic and contextual (partnership) risks identified were well-known, but A4NH's progress on mitigating these risks in the CGIAR transition was less than hoped during 2021.

**Institutional risks.** One strength of A4NH has been its multi-institutional management arrangement. Managing Partners built upon their capabilities for multi-institutional research program design and implementation, including research support, research ethics, and monitoring and evaluation. A key risk, which remains, has been how key external partners, like LSHTM and WUR, could contribute to new CGIAR research initiatives and platforms.

**Programmatic risks.** In the new CGIAR design, the A4NH impact areas on nutrition and health will become a platform. To support research continuity, A4NH has consolidated lessons and evidence. Unfortunately, the new platform has not been established before A4NH ended to allow for some overlap and transfer of outputs.

**Contextual (Partnership) Risks.** A major risk in the CGIAR transition has been to partnerships at multiple levels. Given its cross-sectoral nature, many nutrition and health partners, such as the ANH Academy, the Scaling up Nutrition movement, and national nutrition and health institutes, will remain important to CGIAR. It will be important to integrate program and policy partnerships relative to national food systems transformation into regional and national initiatives and arrangements in CGIAR.

## 2.7 Use of W1/W2 Funding

Table 12 lists some key research, policy, capacity development and dissemination and activities from 2021 funded by Window 1/Window 2 (W1/W2). Some of these activities, were two-year efforts continued from 2020. Given that 2021 was the final year of A4NH, we made additional investment into synthesis activities considered to be important for filling particular evidence gaps and for lessons for future CGIAR research, most of which are also summarized and described in Table 10 of this report. These studies and reviews covered awareness and use of tools for measuring women's empowerment, the nature of successful researcher-implementer partnerships, food systems, and flagship-specific syntheses on food safety in transitioning markets, vector-borne disease risks in irrigated agricultural landscapes, and AMR.

## 3. Financial Summary

The 2021 budget reflected plans for catch-up expenditure to activities that continued and caught up by delays in 2020. The management budget for 2021 had increased expenditure related to a significant partnership between CGIAR and the French government on food systems and nutrition, which combined 2020 and 2021 expenditures. There was also additional investment in final year synthesis studies.

## Part B. Tables

**Table 1: Evidence on progress towards SRF targets (Sphere of interest)**

*A4NH committed to contributions to three SLO targets in our Full Proposal for Phase II and there is new evidence of contribution to add for two. The others are not shown in this table. For links that lead the reader to password-protected sites, please email [a.wyatt@cgiar.org](mailto:a.wyatt@cgiar.org) for access.*

SLO Target (2022)	Brief summary of new evidence of CGIAR contribution	Geographic Scope
1.1 ADOPTION: 100 million more farm households have adopted improved varieties, breeds, trees, and/or improved management practices.	More than 8.5 million farming households were reached with biofortified planting material in 2021, bringing the total number of farming households growing and consuming biofortified crops globally to 12.8 million. Internal reports (password required to access) have been prepared in prior reporting years to describe <a href="#">the estimates</a> and the definitions and methodology for the <a href="#">Global Households Reached Projection Model</a> .	Multi-national: Bangladesh, Burundi, Brazil, The Democratic Republic of the Congo, Colombia, Guatemala, Honduras, India, Kenya, Malawi, Nigeria, Nicaragua, Panama, Pakistan, Rwanda, El Salvador, Tanzania, United Republic, Uganda, Zambia, Zimbabwe
	More than 300,000 farm households have used 5,400 tons of Aflasafe to produce 1 million tons of aflatoxin-safe crops, mainly maize and groundnut. These crops entered both formal and informal markets and benefitted millions of consumers and industries in at least 11 African countries. Based on current estimates, that quantity of aflatoxin-reduced crops produced was enough to feed 100 million people with 100 days of aflatoxin-safe rations. In this <a href="#">publication</a> , i) quantities of Aflasafe produced and used, ii) quantities (tons) of aflatoxin-safe crops produced, and iii) examples of numbers of people benefiting from aflatoxin-reduced crops are discussed. The team from IITA are finalizing a publication with more recent numbers, which will be available after the end of A4NH. In the meantime, an <a href="#">internal memo</a> (password required to access) describes the methodology behind these estimates.	Multi-national: Burkina Faso, Ghana, Gambia, Kenya, Mali, Malawi, Mozambique, Nigeria, Senegal, Tanzania, United Republic, Zambia
2.3 MICRONUTRIENT DEFICIENCIES: 150 million more people, of which 50% are women, without deficiencies of one or more of the following essential micronutrients: iron, zinc, iodine, vitamin A, folate, and vitamin B12	In 2021, 12.8 million farming households were growing biofortified crops and 64 million people from these households were consuming biofortified foods as a result of HarvestPlus-led delivery efforts. However, this is an underestimate because in addition to the individual household members of the growing households, there has been increased sales of biofortified products in 2021, which would translate into more people consuming biofortified products through the market and more people with reduced micronutrient deficiencies. Internal reports (password required to access) have been prepared in prior reporting years to describe <a href="#">the estimates</a> and the definitions and methodology for the <a href="#">Global Households Reached Projection Model</a> .	Multi-national: Bangladesh, Brazil, The Democratic Republic of the Congo, Colombia, Guatemala, Honduras, India, Kenya, Malawi, Nigeria, Nicaragua, Panama, Pakistan, Rwanda, El Salvador, Tanzania, United Republic, Uganda, Zambia, Zimbabwe

**Table 2: Condensed list of policy contributions in 2021 (sphere of influence)**

Presented chronologically by flagship. For readability, URLs have been embedded as hyperlinks in this table. The information was entered as required in MARLO. For links that lead the reader to password-protected sites, please email [a.wyatt@cgiar.org](mailto:a.wyatt@cgiar.org) for access.

Title of policy, legal instrument, investment or curriculum	Description of policy, legal instrument, investment or curriculum	Level of Maturity	Link to sub-IDOs	CGIAR cross-cutting marker score				Link to OICR (obligatory if Level of Maturity is 2 or 3) or link to evidence
				Gender	Youth	CapDev	Climate Change	
408 - The Ministry of Agriculture and Rural Development incorporated more A4NH evidence in implementation of nutrition-sensitive agriculture approaches in Viet Nam as part of their National Action Plan for Zero Hunger	In 2021, the Ministry of Agriculture and Rural Development started implementing A4NH-informed nutrition-sensitive agriculture approaches in 11 provinces as part of their Zero Hunger initiative.	Stage 2	<ul style="list-style-type: none"> <li>• Conducive agricultural policy environment</li> <li>• Enhanced institutional capacity of partner research organizations</li> </ul>	0 - Not Targeted	0 - Not Targeted	1 - Significant	0 - Not Targeted	<a href="#">OICR4394</a> “The Ministry of Agriculture and Rural Development incorporated A4NH evidence in implementation of nutrition-sensitive agriculture approaches in Viet Nam as part of their National Action Plan for Zero Hunger”
794 - National Food Systems Summit Dialogues in Bangladesh, Ethiopia, and Viet Nam incorporate A4NH evidence around food systems for healthy and sustainable diets as part of the UN Food Systems Summit	The national Dialogues helped Member States to develop pathways towards sustainable food systems and solicit expressions of intention to support these pathways from a broad range of stakeholders.	Stage 1	<ul style="list-style-type: none"> <li>• Conducive agricultural policy environment</li> </ul>	0 - Not Targeted	0 - Not Targeted	1 - Significant	1 - Significant	<a href="#">OICR4367</a> “A4NH researchers contribute evidence around food systems transformation for safe, healthy and sustainable diets to the United Nations Food Systems Summit (UNFSS) process”
827 - National Food Systems Summit Dialogues in Viet Nam incorporate A4NH evidence around food safety as part of the United Nation Food Systems Summit	The national Dialogues helped Member States to develop pathways towards safe and sustainable food systems and solicit expressions of intent to support these pathways from a broad range of stakeholders.	Stage 1	<ul style="list-style-type: none"> <li>• Conducive agricultural policy environment</li> <li>• Appropriate regulatory environment for food safety</li> </ul>	0 - Not Targeted	0 - Not Targeted	1 - Significant	0 - Not Targeted	<a href="#">OICR4367</a> “A4NH researchers contribute evidence around food systems transformation for safe, healthy and sustainable diets to the United Nations Food Systems Summit (UNFSS) process”
803 - A4NH food systems research informs major multi-lateral investment in	A4NH research - a literature review, re-interpretation of data, and examination of consumption	Stage 1	<ul style="list-style-type: none"> <li>• Increased capacity of partner organizations, as evidenced by rate</li> </ul>	1 - Significant	1 - Significant	0 - Not Targeted	0 - Not Targeted	In 2021, the Bill & Melinda Gates Foundation (BMGF) and the United Kingdom Foreign, Commonwealth and Development Office (FCDO) began designing a major multi-lateral investment in a new program to

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Title of policy, legal instrument, investment or curriculum	Description of policy, legal instrument, investment or curriculum	Level of Maturity	Link to sub-IDOs	CGIAR cross-cutting marker score				Link to OICR (obligatory if Level of Maturity is 2 or 3) or link to evidence
				Gender	Youth	CapDev	Climate Change	
new program to improve fruit and vegetable intake in low- and middle-income countries	and supply of fruits and vegetables in seven countries - shaped priorities for the new program.		of investments in agricultural research • Optimized consumption of diverse nutrient-rich food					improve fruit and vegetable intake in low- and middle-income countries (LMICs). Although the multi-year project will not begin before the end of A4NH, it was informed by A4NH research, funded by BMGF. A <a href="#">scoping study</a> focused on the consumption and production of fruits and vegetables as part of the food system in LMICs, and, in particular, in seven low-income countries. The researchers first mapped trends in global and regional food systems, with a focus on South Asia and East and West Africa. In the country study, the researchers zoomed in on Bangladesh, Ethiopia, Nepal, Nigeria, Tanzania, India and Burkina Faso. The study combined a literature review, reinterpretation of data, and examination of consumption and supply. The study looked specifically at what key issues need to be addressed to enhance consumption while offering income opportunities, <a href="#">notably for women and youth</a> . The total investment is still being negotiated, which is why we have listed the amount as \$1.00.
793 - Mini-massive open online course (MOOC) on food environments for healthy sustainable diets, co-developed by A4NH researchers and partners	The course is designed for professionals from government, ministries and NGOs who are aware of the need for food environment interventions.	Stage 1	<ul style="list-style-type: none"> <li>Enhanced institutional capacity of partner research organizations</li> <li>Increased capacity for innovations in partner research organizations</li> </ul>	0 - Not Targeted	0 - Not Targeted	2 - Principal	1 - Significant	This self-paced <a href="#">online course</a> was co-developed by A4NH managing partner, Wageningen University & Researcher with the French public research institutes, Institut National de la Recherche Agronomique (INRAE) and Institut de Recherche pour le Développement (IRD), as part of a partnership launched in 2019 between CGIAR and the French government. The course is hosted by WUR and was offered three times in 2021 (in October, November and December) for free, and one is already scheduled for January 2022. The first cohort had more than 1000 people registered. Course participants are recommended to have a basic knowledge of food systems, value chains, and nutrition and health before starting this course. By the end of the course, participants will be able to explain the concept of the food environment, typologies and ongoing transitions; know how the food environment can support healthy sustainable diets; explain the challenges and trade-offs to consider in food environments; and interpret and analyze examples of food environment innovations supporting healthy sustainable diets in low- and middle-income settings.

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Title of policy, legal instrument, investment or curriculum	Description of policy, legal instrument, investment or curriculum	Level of Maturity	Link to sub-IDOs	CGIAR cross-cutting marker score				Link to OICR (obligatory if Level of Maturity is 2 or 3) or link to evidence
				Gender	Youth	CapDev	Climate Change	
811 - The Global Child Nutrition Foundation reported that school meals around the world are a somewhat underutilized channel for providing key micronutrients to children and suggests awareness raising around biofortified foods	The report was based on the 2019 Global Survey of School Meal Programs and is the only global database on this topic. HarvestPlus provided data and supplementary information.	Stage 1	<ul style="list-style-type: none"> <li>Increased access to diverse nutrient-rich foods</li> <li>Optimized consumption of diverse nutrient-rich foods</li> </ul>	0 - Not Targeted	2 - Principal	1 - Significant	0 - Not Targeted	In 2019, the Global Child Nutrition Foundation (GNCF) led the design of a global survey to produce a comprehensive description of all the core aspects of large-scale school meal programs around the world. The first round of survey data gathering, data cleaning, and analysis for was completed in June 2020. The full report of the <a href="#">2019 Global Survey of School Meal Programs</a> , which summarized the data received, was published in 2021. HarvestPlus provided data and supplementary information for information about biofortification in school meals. One of the conclusions is that school meal programs are an underutilized channel for providing key micronutrients to children. One of the recommend areas for study or action was to increase awareness among school meal program designers about biofortification options and benefits.
813 - First standard for increased zinc content in wheat, maize and rice grain for food for human consumption published by British Standards Institution	The standard specifies requirements for zinc-enriched maize, rice, and wheat for consumption. It includes requirements for levels of zinc for different grades of grain; sampling guidance; and labelling and packaging.	Stage 1	<ul style="list-style-type: none"> <li>Optimized consumption of diverse nutrient-rich foods</li> <li>Conducive agricultural policy environment</li> </ul>	0 - Not Targeted	0 - Not Targeted	0 - Not Targeted	0 - Not Targeted	This <a href="#">standard for zinc biofortified grains and foods</a> (rice, wheat and maize) was developed by a steering group of international experts in government, plant & crop sciences, grain procurement and academics. It was sponsored by HarvestPlus through a <a href="#">partnership</a> is funded by the German Federal Ministry for Economic Cooperation and Development, and the Government of the Netherlands. For this process, HarvestPlus presented the portfolio of CGIAR-generated evidence on zinc biofortification. Standards are developed by dedicated panels of experts, within technical committees, facilitated by the British Standards Institute (BSI). A standard undergoes various stages of development, beginning with the Proposal stage, which is aimed at affirming the market need for a standard. Once a proposal for a standard is approved, the relevant panel of experts in the area drafts the standard. As soon as a draft is mature enough, it undergoes public consultation when it is made available for anyone to view and comment. Standards are expected to contribute to the <a href="#">commercializing and scaling of zinc biofortified foods</a> .
435 - Uganda Nutrition Action Plan III for 2021-2026 includes strategies to	The Plan provides the framework for addressing nutrition issues in Uganda sequentially to develop	Stage 1	<ul style="list-style-type: none"> <li>Optimized consumption of diverse nutrient-rich foods</li> </ul>	0 - Not Targeted	0 - Not Targeted	0 - Not Targeted	0 - Not Targeted	The Government of Uganda launched its multi-sectoral Uganda Nutrition Action Plan in November 2011 and the next iteration, Uganda Nutrition Action Plan II, is near completion. HarvestPlus



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Title of policy, legal instrument, investment or curriculum	Description of policy, legal instrument, investment or curriculum	Level of Maturity	Link to sub-IDOs	CGIAR cross-cutting marker score				Link to OICR (obligatory if Level of Maturity is 2 or 3) or link to evidence
				Gender	Youth	CapDev	Climate Change	
increase adoption of biofortified crops	strong and quality human capital that will propel socioeconomic transformation.		<ul style="list-style-type: none"> <li>• Conducive agricultural policy environment</li> </ul>					participated in the development process of the updated Plan and provided inputs and technical assistance. The Plan itself is not posted online, but it is referenced (p.5) in this <a href="#">document published by USAID</a> . This policy achievement builds upon and reinforces other active policies in Uganda that support biofortification, including <a href="#">Vision 2040 National Development Plan III</a> and the <a href="#">Maternal Infant Young Child and Adolescent Nutrition (MIYCAN) Action Plan 2020-2025</a> .
812 - Nigeria's National Agricultural Technology and Investment Plan (NATIP) 2021 - 2024 includes biofortification	The Plan is part of a set of policies and strategies to guide a growth path that would sufficiently meet the domestic food requirements and export quality levels.	Stage 1	<ul style="list-style-type: none"> <li>• Conducive agricultural policy environment</li> <li>• Optimized consumption of diverse nutrient-rich foods</li> </ul>	0 - Not Targeted	0 - Not Targeted	1 - Significant	1 - Significant	When Nigeria's Agricultural Promotion Policy (APP) expired in 2020, the Federal Government developed another policy, <a href="#">National Agricultural Technology and Innovation Policy (NATIP)</a> to cover the 2021-2025 period. NATIP provides an integrated approach to agricultural development in terms of access and application of improved inputs, improves the linkage between agricultural research and training institutions, while ensuring climate change management and sustainable agriculture, nutrition, and security of agricultural land and investments. NATIP references the positive role biofortified crops can play in achieving these goals. This policy is one of many other active or forthcoming policies in Nigeria that include biofortification, such as the Agricultural Sector Food Security and Nutrition Strategy (AFSNS) by the Federal Ministry of Agriculture and Rural Development 2016 – 2025 and micronutrient deficiency control guidelines which are under revision. Copies of these policies are not currently available online.
438 - Committee on World Food Security (CFS) Members endorse new Voluntary Guidelines on Food Systems and Nutrition, which will support countries in efforts to eradicate all forms of hunger and malnutrition	The Voluntary Guidelines provide guidance, mainly to governments, on effective policies, investments and institutional arrangements that address malnutrition in all its forms through a comprehensive food systems approach.	Stage 2	<ul style="list-style-type: none"> <li>• Conducive agricultural policy environment</li> <li>• Optimized consumption of diverse nutrient-rich foods</li> </ul>	1 - Significant	1 - Significant	1 - Significant	1 - Significant	<a href="#">OICR4366</a> “Adoption, Dissemination and Support of the Committee on World Food Security’s Voluntary Guidelines for Food Systems and Nutrition for Use by Governments, Private Sector, Civil Society and Other Stakeholders for Plans, Policies, and Investments”

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Title of policy, legal instrument, investment or curriculum	Description of policy, legal instrument, investment or curriculum	Level of Maturity	Link to sub-IDOs	CGIAR cross-cutting marker score				Link to OICR (obligatory if Level of Maturity is 2 or 3) or link to evidence
				Gender	Youth	CapDev	Climate Change	
804 - Project-level Women's Empowerment in Agriculture Index (pro-WEAI) Foundations Module, a distance learning course developed by A4NH gender researchers	The distance learning course is designed to train researchers and practitioners on the pro-WEAI tool, from its background to its practical application within the project context.	Stage 1	<ul style="list-style-type: none"> <li>Increased capacity for innovations in partner research organizations</li> <li>Gender-equitable control of productive assets and resources</li> </ul>	2 - Principal	0 - Not Targeted	2 - Principal	0 - Not Targeted	In response to growing demand, A4NH researchers from IFPRI, with support from the Bill & Melinda Gates Foundation (BMGF), the United States Agency for International Development (USAID), and A4NH developed a distance learning course for the Women's Empowerment in Agriculture Index (WEAI), and the project-level WEAI (pro-WEAI). The online course is designed to meet the needs of a range of users (e.g., quantitative analysts, monitoring & evaluation specialists, donors, field supervisors) by teaching specific skills related to the WEAI in an online learning environment. Digital certification is provided upon successful completion. To date, the <a href="#">pro-WEAI Foundations Module</a> is available. The team intends to develop <a href="#">five additional modules</a> which will become available in the coming years after A4NH ends.
690 - Surveillance strategies for antimicrobial resistance (AMR) bacteria in poultry and dairy implemented in two provinces in Kenya with potential for nation-wide adoption and use	Antimicrobial resistance (AMR) surveillance and monitoring detects and tracks changes and trends in microbial populations in livestock production systems including drug-resistant microorganisms.	Stage 1	<ul style="list-style-type: none"> <li>Reduced livestock and fish disease risks associated with intensification and climate change</li> <li>Increased safe use of inputs</li> </ul>	0 - Not Targeted	0 - Not Targeted	1 - Significant	0 - Not Targeted	With the national antimicrobial resistance (AMR) task force, A4NH researchers co-developed <a href="#">national surveillance policies and strategies</a> for mitigating the development of AMR in animals in Kenya. More specifically, A4NH researchers supported the implementation of surveillance activities in poultry and dairy production systems in two provinces, screening for AMR in four bacterial species, Salmonella, Campylobacter, E.coli and Enterococci. In addition, AMR surveillance capacity was increased through enhanced veterinary laboratory capacity at six labs that serve 15 counties. To date, the AMR surveillance protocols have been established and approved by the Directorate of Veterinary Services for use in those two provinces and were submitted to the National AMR Task Force for approval and nationwide adoption. These outcomes were part of an investment from the Fleming Fund country grant to Kenya, the CGIAR AMR Hub, as well as A4NH.

**Table 3: List of Outcome/Impact Case Reports from 2021 (sphere of influence)***Presented chronologically by flagship.*

<b>Title of Outcome/Impact Case Report (OICR)</b>	<b>Link to full OICR</b>	<b>Maturity level</b>
OICR4394 - The Ministry of Agriculture and Rural Development incorporated A4NH evidence in implementation of nutrition-sensitive agriculture approaches in Viet Nam as part of their National Action Plan for Zero Hunger	<a href="#">Link</a>	Stage 1
OICR4367 - A4NH researchers contribute evidence around food systems transformation for safe, healthy and sustainable diets to the United Nations Food Systems Summit (UNFSS) process	<a href="#">Link</a>	Stage 1
OICR4541 - Biofortified crops are sustainably integrated in Nigeria's food systems and benefiting approximately 13 million consumers	<a href="#">Link</a>	Stage 2
OICR4352 - Biofortification mainstreamed into national breeding programs in Bangladesh, India, and Rwanda through partnerships between HarvestPlus and National Agricultural Research and Extension Systems (NARES)	<a href="#">Link</a>	Stage 2
OICR4353 - Process developed by IITA researchers in Nigeria maximizes private sector production of Aflasafe products (biocontrol products) for commercial use in Senegal, Tanzania, and Nigeria benefiting 12 countries across the African continent	<a href="#">Link</a>	Stage 1
OICR3268 - Evaluating and improving the African Union's Africa Food Safety Index, a tool that will help to institutionalize tracking of food safety in African Union Member States	<a href="#">Link</a>	Stage 1
OICR4366 - Adoption, Dissemination and Support of the Committee on World Food Security's Voluntary Guidelines for Food Systems and Nutrition for Use by Governments, Private Sector, Civil Society and Other Stakeholders for Plans, Policies, and Investments	<a href="#">Link</a>	Stage 1
OICR4359 - Development program implementers, funders, and evaluators use A4NH tools to design, implement, and evaluate nutrition-sensitive agricultural programs seeking to empower women	<a href="#">Link</a>	Stage 2
OICR3273 - Methodology for measuring the affordability of nutritious foods and diets helps decisionmakers across the globe understand how to better utilize agriculture to improve nutrition	<a href="#">Link</a>	Stage 1

**Table 4: Condensed list of innovations by stage for 2021***Presented chronologically by flagship.*

Title of innovation with link	Innovation Type	Stage of innovation	Geographic scope
<a href="#">370 - Methodology to analyse national food systems and create food systems profiles and priority areas for research</a>	Social Science	Stage 4: uptake by next user	Multi-national: Bangladesh, Ethiopia, Nigeria, The Socialist Republic of Viet Nam
<a href="#">362 - Participatory methodology for profiling the status and resilience of indigenous people's food systems in eight countries</a>	Research and Communication Methodologies and Tools	Stage 3: available/ready for uptake	Multi-national: Cameroon, Colombia, Guatemala, India, Mali, Norway, Solomon Islands, The Socialist Republic of Viet Nam
<a href="#">378 - Market level innovations to improve vegetable intake in urban areas in Nigeria</a>	Social Science	Stage 3: available/ready for uptake	Sub-national: Nigeria
<a href="#">379 - Methodology for stakeholder-led identification of platforms for healthier diets (mechanisms to support the scaling and anchoring of food systems transformation for healthier diets) in Bangladesh, Ethiopia, Nigeria, and Viet Nam</a>	Research and Communication Methodologies and Tools	Stage 3: available/ready for uptake	Multi-national: Bangladesh, Ethiopia, Nigeria, The Socialist Republic of Viet Nam
<a href="#">792 - Chaya (native plant known as tree spinach) introduced in school feeding programme in Chiquimula, Guatemala</a>	Production systems and Management practices	Stage 3: available/ready for uptake	Sub-national: Guatemala
<a href="#">1268 - Food Based Dietary Guidelines for Ethiopia: dietary recommendations for increased diet quality, including diversity and food safety for optimal health</a>	Social Science	Stage 3: available/ready for uptake	National: Ethiopia
<a href="#">2593 - The International Fund for Agricultural Development's 2021 Rural Development Report cites A4NH evidence in its analysis of opportunities for transforming food systems</a>	Social Science	Stage 3: available/ready for uptake	Global
<a href="#">1938 - World Index for Sustainability and Health (WISH), a globally applicable index for healthy diets from sustainable food systems</a>	Research and Communication Methodologies and Tools	Stage 3: available/ready for uptake	Global
<a href="#">1939 - Diet Quality Questionnaire, a tool for collecting food intake data to draw conclusions about diet quality</a>	Research and Communication Methodologies and Tools	Stage 3: available/ready for uptake	Global
<a href="#">1975 - Consumer-oriented food system innovations to increase consumer awareness and fruit and vegetable intake in urban areas of Nigeria and Viet Nam</a>	Social Science	Stage 3: available/ready for uptake	Multi-national: Nigeria, The Socialist Republic of Viet Nam
<a href="#">2473 - Methodology to prioritize local food systems issues and identify possible demand-based actions and interventions in Viet Nam</a>	Research and Communication Methodologies and Tools	Stage 3: available/ready for uptake	Sub-national: The Socialist Republic of Viet Nam

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Title of innovation with link	Innovation Type	Stage of innovation	Geographic scope
<a href="#">2475 - School-based intervention combining nutrition education and provision of healthy foods to increase fruit and vegetable consumption in Viet Nam</a>	Social Science	Stage 3: available/ready for uptake	Sub-national: The Socialist Republic of Viet Nam
<a href="#">2476 - Healthy Eating Index for Viet Nam, a tool to evaluate the extent to which populations are following dietary recommendations</a>	Social Science	Stage 3: available/ready for uptake	National: The Socialist Republic of Viet Nam
<a href="#">2474 - Food Systems Resource Center, a website providing research and support material on food systems and how to support countries in transformations towards equitable access to nutritious and sustainable diets</a>	Research and Communication Methodologies and Tools	Stage 3: available/ready for uptake	Global
<a href="#">1472 - Biofortification Priority Index (BPI), a composite crop-specific index that ranks countries according to their suitability for investment in biofortification</a>	Social Science	Stage 3: available/ready for uptake	Global
<a href="#">2532 - Videos summarizing evidence-based messages on nutritional benefits of biofortified foods and relevance to national food programs in India</a>	Research and Communication Methodologies and Tools	Stage 3: available/ready for uptake	National: India
<a href="#">2629 - BRRI dhan 100: A new zinc biofortified rice variety released in Bangladesh</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Bangladesh
<a href="#">2534 - Muracho: A new vitamin A biofortified banana/plantain variety released in Burundi</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Burundi
<a href="#">2622 - Bira: A new vitamin A biofortified banana/plantain variety released in Burundi</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Burundi
<a href="#">2623 - Pelipita: A new vitamin A biofortified banana/plantain variety released in Burundi</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Burundi
<a href="#">2624 - Lai: A new vitamin A biofortified banana/plantain variety released in Burundi</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Burundi
<a href="#">2625 - Pisang papan: A new vitamin A biofortified banana/plantain variety released in Burundi</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Burundi
<a href="#">2626 - BRS Nuti: A new vitamin A biofortified orange sweet potato variety released in Brazil</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Brazil
<a href="#">2628 - Fedearroz BIOZn035: A new zinc biofortified rice variety released in Colombia</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Colombia
<a href="#">2768 - CRI-HarvestPlus: A new vitamin A biofortified hybrid released in Ghana</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Ghana
<a href="#">2769 - ZAMS666A: A new vitamin A biofortified maize hybrid released in Ghana</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Ghana
<a href="#">2770 - CRI-Obeng: A new vitamin A biofortified maize hybrid released in Ghana</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Ghana
<a href="#">2627 - Nawab-21: A new zinc biofortified wheat variety released in Pakistan</a>	Genetic (varieties and breeds)	Stage 3:	National:

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Title of innovation with link	Innovation Type	Stage of innovation	Geographic scope
		available/ready for uptake	Pakistan
<a href="#">2630 - RW-BB183: A new iron biofortified beans variety released in Rwanda</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Rwanda
<a href="#">2631 - RW-BB186: A new iron biofortified beans variety released in Rwanda</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Rwanda
<a href="#">2632 - RW-BB181: A new iron biofortified beans variety released in Rwanda</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Rwanda
<a href="#">2633 - RW-BB184: A new iron biofortified beans variety released in Rwanda</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Rwanda
<a href="#">2634 - RW-CB181: A new iron biofortified beans variety released in Rwanda</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Rwanda
<a href="#">2635 - RW-CB184: A new iron biofortified beans variety released in Rwanda</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Rwanda
<a href="#">2636 - RW-CB186: A new iron biofortified beans variety released in Rwanda</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Rwanda
<a href="#">2637 - RW-CB189: A new iron biofortified beans variety released in Rwanda</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Rwanda
<a href="#">2638 - CBC6: A new iron biofortified cowpea variety released in Zimbabwe</a>	Genetic (varieties and breeds)	Stage 3: available/ready for uptake	National: Zimbabwe
<a href="#">2533 - Use of additional biomarkers in the assessment of the impact of food based zinc interventions on zinc status in adults</a>	Biophysical Research	Stage 1: discovery/proof of concept	Global
<a href="#">1121 - Dry inoculum (active ingredient in Aflasafe): reduces manufacturing costs for Aflasafe and addresses barrier to commercialization</a>	Production systems and Management practices	Stage 4: uptake by next user	Regional: Sub-Saharan Africa
<a href="#">684 - Use of nudges to improve food safety in the pork value chain in Viet Nam</a>	Social Science	Stage 3: available/ready for uptake	Sub-national: The Socialist Republic of Viet Nam
<a href="#">720 - Mobile phone-based surveillance system for slaughterhouses to report and monitor livestock diseases and syndromes in Uganda</a>	Research and Communication Methodologies and Tools	Stage 1: discovery/proof of concept	Sub-national: Uganda
<a href="#">2537 - Use of nudges to improve food safety in the pork value chain in Uganda</a>	Social Science	Stage 1: discovery/proof of concept	Sub-national: Uganda
<a href="#">633 - Methods for measuring the cost of the most affordable nutritionally adequate diet in a country</a>	Social Science	Stage 4: uptake by next user	Global
<a href="#">634 - Pro-WEAI (project-level Women's Empowerment in Agriculture Index)</a>	Social Science	Stage 4: uptake by next user	Multi-national: Bangladesh, Burkina Faso, Ethiopia, Ghana, India,



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Title of innovation with link	Innovation Type	Stage of innovation	Geographic scope
			Kenya, Mali, Nepal, United Republic of Tanzania
<a href="#">2095 - Project-level Women's Empowerment in Agriculture Index for Market Inclusion (pro-WEAI+MI)</a>	Social Science	Stage 3: available/ready for uptake	Multi-national: Bangladesh, Benin, Guatemala, Honduras, India, Malawi, Philippines
<a href="#">2591 - Recommendations to POSHAN Abhiyaan, India's national nutrition mission on issues to consider in strengthening efforts to improve data availability and data use in the context of POSHAN Abhiyaan</a>	Research and Communication Methodologies and Tools	Stage 3: available/ready for uptake	National: India
<a href="#">1986 - Suite of tools for measuring cost and cost-effectiveness of multisectoral nutrition strategies and interventions</a>	Social Science	Stage 3: available/ready for uptake	Global
<a href="#">2639 - Rift Valley fever (RVF) project on Zooniverse, a citizen science platform that allows registered volunteers to identify animals in landscapes from drone imagery</a>	Research and Communication Methodologies and Tools	Stage 2: successful piloting	Sub-national: Kenya
<a href="#">2640 - Updated evidence on malaria risk associated with irrigated rice in sub-Saharan Africa</a>	Social Science	Stage 2: successful piloting	Regional: Sub-Saharan Africa
<a href="#">593 - New version of near pen-side diagnostic assay, a diagnostic tool farmers or meat inspectors in Kenya and Uganda could use to detect Taenia solium cyst infections (cysticercosis) in pigs</a>	Biophysical Research	Stage 2: successful piloting	Multi-national: Kenya, Uganda
<a href="#">2641 - Evidence of antimicrobial resistance (AMR) in food crop value chains</a>	Social Science	Stage 1: discovery/proof of concept	Global
<a href="#">2469 - Closed user group mobile phone platforms to enhance communication and coordination of One Health activities in Kenya</a>	Research and Communication Methodologies and Tools	Stage 2: successful piloting	Sub-national: Kenya
<a href="#">2467 - Drone imaging and remote sensing data to identify mosquito breeding sites and heterogeneity in local transmission risks in Kenya</a>	Biophysical Research	Stage 1: discovery/proof of concept	Sub-national: Kenya
<a href="#">2468 - Revised protocol for whole genome sequencing of Rift Valley fever (RVF) virus in Kenya</a>	Biophysical Research	Stage 1: discovery/proof of concept	National: Kenya
<a href="#">1349 - Stepwise approach for formulating Kenya's country-level target goals for elimination of taenia solium taeniosis/cysticercosis (one of the top ranked foodborne parasitic hazards globally)</a>	Production systems and Management practices	Stage 1: discovery/proof of concept	National: Kenya

**Table 5: Summary of status of planned outcomes and milestones (sphere of influence-control)**

*Presented chronologically by flagship. For readability, URLs have been embedded as hyperlinks in this table. The information was entered as required in MARLO. For links that lead the reader to password-protected sites, please email [a.wyatt@cgiar.org](mailto:a.wyatt@cgiar.org) for access.*

FP Outcomes	Sub-DOs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
FP1 Outcome: Partners and other CRPs incorporate nutrition, health and gender in agri-food value chains and food systems programs	<ul style="list-style-type: none"> <li>Enhanced institutional capacity of partner research organizations</li> <li>Increased capacity for innovations in partner research organizations</li> </ul>	<p>In 2021 the number of partners and other CRPs that incorporated results of A4NH research into their programs increased in all four A4NH focus countries (Bangladesh, Ethiopia, Nigeria, and Viet Nam). Stakeholders ranged from local (research) institutes, universities to government agencies. Other agri-food system CRPs used components of the A4NH food system evidence in their programs to assess tradeoffs in food system outcomes (CCAFS) and to develop a nutrition module in their tools (FTA).</p>	2021 - At least one other agri-food system CRP uses components of the A4NH food systems framework conceptualizing the interactions between diet quality and food systems and their environmental, economic, social, cultural and policy drivers to design and/or implement food system innovations.	Completed	In 2021, two other CRPs used components of the A4NH food systems framework conceptualizing the interactions between diet quality and food systems and their environmental, economic, social, cultural and policy drivers. CCAFS applied methods around assessing food systems trade-offs in Bangladesh. A publication, titled Zero Hunger Zero Emissions (forthcoming), was co-authored by researchers from CCAFS and A4NH along with others from Wageningen University & Research, Oxford University, and Utrecht University. FTA used A4NH's work around seasonality and food group classifications in one of their current projects designed to help communities to optimize the selection of the most appropriate tree species to cover year-round nutrient needs. The evidence link points to that joint publication.	<a href="#">Paper on "Zero Hunger Zero Emissions"</a>
			2021 - At least two stakeholders from two A4NH focus countries use evidence on diet quality and food systems linkages and key leverage points for improving diets through food systems in policy preparations and research or investment programming	Completed	In Nigeria, the Federal University of Agriculture, Abeokuta and Landmark University used the co-developed Cost of Recommended Diet methodology and a co-authored journal article with A4NH researchers was published in Frontiers in Sustainable Food Systems. A webinar and brief based on this state-level assessment from Nigeria are expected to be available in 2021 (after A4NH ends), a joint effort between A4NH researchers from Wageningen University & Researcher, the Federal Ministry of Agriculture and Rural Development in Nigeria, and Tufts University. In Bangladesh, the Dhaka Municipality and the Food and Agriculture Organization of the United Nations (FAO) are using A4NH approaches for food system diagnosis, interventions and policies as part of a major urban food systems project in Dhaka, financed by the Netherlands Embassy. A link to the project description is provided. The project will continue through 2023 after A4NH ends. In Ethiopia, Bahir Dar University is using the food system and diet linkages frameworks to develop their baselines as well as interventions in the European Union Horizon 2020 HealthyFoodAfrica project. Again, a link to the project description is provided, but this project will continue beyond the end of A4NH.	<a href="#">Cost of Recommended Diet methodology</a> <a href="#">Dhaka Food System project description</a> <a href="#">Healthy Food Africa project description</a>

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FP Outcomes	Sub-DOs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
FP1 Outcome: Partners, including value chain actors, use evidence from impact evaluations when making operational and investment decisions	<ul style="list-style-type: none"> <li>Increased availability of diverse nutrient-rich foods</li> <li>Increased access to diverse nutrient-rich foods</li> <li>Optimized consumption of diverse nutrient-rich foods</li> </ul>	<p>In 2021, A4NH finalized and reported evidence from impact evaluations of three, gender-sensitive food systems innovations in Ethiopia, Nigeria, and Viet Nam, developed in collaboration with value chain partners. At least eight partners have worked with A4NH to incorporate evidence generated through A4NH in their programming. Furthermore, a synthesis report highlighting some promising innovations with potential for further research and scaling, proposed a revised impact pathway for further investments in food systems innovations.</p>	2021 - Value chain partners in Ethiopia and Nigeria implement at least two gender-sensitive, food system interventions aligned with findings from A4NH	Completed	<p>In Ethiopia, A4NH researchers co-developed and produced with a local partner two short videos designed to promote fruit and vegetable consumption in an urban setting, Addis Ababa, Ethiopia (1). The videos were developed and tested in 2020 with NEED, an Ethiopian business providing dietetics, nutrition, food science and technological services and products, and results were published in 2021 (2). Even four months after viewing the video, average household consumption of fruits and vegetables increased by about 10 percent in both treatment groups relative to the control group, both in kilocalorie and consumption expenditure terms. The videos are designed to be shown on national TV, suggesting that embedding dietary messages in popular media can have positive impacts on diet quality at scale. The videos intentionally include both male and female voices talking about improved nutrition. Survey respondents were largely female; researchers did not find a statistically significant difference in response by gender. In Nigeria, several food systems innovations have been co-developed and tested with local partners, in particular to address post-harvest losses of perishable healthy foods, like tomatoes. The innovations in Nigeria target vegetables, which are traditionally sold by women. So, two innovations there were implicitly designed to reach and benefit women.</p>	<a href="#">Videos</a> <a href="#">Experimental evidence on video-based BCC in Ethiopia</a>
			2021 - Eight partners, including value chain actors, build capacity to use A4NH evaluation findings to inform operational and investment decisions in work on food systems	Completed	<p>In Ethiopia, we highlight the work with Addis Ababa University and NEED, an Ethiopian business providing dietetics, nutrition, food science and technological services and products, around a scalable video-based intervention to promote fruit and vegetable consumption among urban consumers (1). In Nigeria and Viet Nam, partnerships continued with Twiga Foods, University of Ibadan, Hanoi Medical University, and Rikolto, as part of a bilaterally-supported project to evaluate different strategies for promoting fruit and vegetable consumption which will continue after A4NH ends (2). In 2021, A4NH researchers translated a published paper on food systems innovations (3) into an online evidence map showing which food systems innovations have been studied, and which ones have been shown as effective (4). The online inventory includes 150 studies primarily from Bangladesh, Ethiopia, Nigeria, and Viet Nam, countries which represent a range of diet and (sub)-national food system contexts at various stages of food system transformation and urbanization. The number of partners using this evidence cannot be quantified as this time, but it was widely targeted to participants in the United Nations Food Systems Summit (UNFSS) as they identified and prioritized game-changing solutions.</p>	<a href="#">Project note on experiment using video-based comms</a> <a href="#">Food environment in Hanoi and Ibadan</a> <a href="#">Review of food systems innovations</a> <a href="#">Online evidence map of food systems innovations</a>

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FP Outcomes	Sub-IDs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
FP1 Outcome: Public-private partnerships formed to promote implementation of A4NH strategies for agri-food value chain/food system innovations	<ul style="list-style-type: none"> <li>Increased availability of diverse nutrient-rich foods</li> <li>Enhanced institutional capacity of partner research organizations</li> <li>Increased access to diverse nutrient-rich foods</li> </ul>	<p>Several partnerships to implement food systems innovations were formed. The 2021 milestone focuses on examples from Ethiopia and Nigeria and an internal report that synthesized the role of the private sector in food system transformation processes in low- and middle-income countries more broadly. In addition, researchers will continue to work with local retailers and small enterprises in the co-creation of innovations to improve fruit and vegetable intakes that are being evaluated in urban areas of Nigeria and Viet Nam after A4NH ends.</p>	2020 extended to 2021 - Private sector partners from 2 of the 4 focus countries build knowledge on opportunity areas and partners to work with to support food systems for healthier diets.	Completed	<p>We spotlight two private sector partners who supported research on food systems for healthier diets in 2021 and will continue after A4NH ends. NEED, an Ethiopian business providing dietetics, nutrition, food science and technological services and products, co-developed a scalable video-based intervention with FP1 to promote fruit and vegetable consumption among urban consumers. In Nigeria, FP1 partnered with a microfinance institution called Capital Sage to develop a coupon management and redemption system for specific fruits in local markets in Ibadan. This was a critical component of a randomized controlled trial designed to address barriers to affordability of healthy foods. Capital Sage provided an interesting repayment method. Capital Sage agents circulate in Ibadan, acting as mobile points of sale terminals for basic transactions. In this trial, the vendors logged coupons in the system with their mobile phone and the reimbursement value was transferred to the vendors' mobile wallets. Vendors could "cash out" their mobile wallets by visiting Capital Sage agents in the market. In both settings, FP1 researchers were able to engage a wide variety of vendors willing to accept coupons in exchange for their produce, meeting the goal of changing affordability without requiring consumers to substantially adjust their purchasing habits.</p>	<a href="#">Research on using vouchers to promote consumption in Ibadan</a> <a href="#">Videos</a>
			2021 - Guidance based on A4NH experiences on working with the private sector for food system transformation prepared and disseminated to decisionmakers	Partially Complete	<p>A synthesis study was conducted and finalized as an internal report (password required to access the link). Unfortunately, our dissemination plans to decisionmakers were cut short because of time and resources and that is why this is reported as partially completed. The study highlights the role of the private sector in food system transformation processes and its contribution to food and nutrition security in developing countries, based on an analysis of 88 identified studies. The authors find that only a few private sector studies seriously addressed trade-offs for food systems change. Much attention was given to opportunities for better bilateral linkages with neighboring upstream (supplier) or downstream (consumer) segments of the supply chain. Reaching improved food systems outcomes was pursued through three different channels: (i) providing leadership to innovation processes, (ii) learning and relationship management between key food system stakeholders, and (iii) creating policy conditions for food systems change. Depending on the barriers or catalysts for influencing food system outcomes, the authors discuss several potential strategies for increasing societal impact of private food sector activities.</p>	<a href="#">Synthesis report on working with the private sector for food system transformation</a>
FP1 Outcome: Key partners, stakeholders, and	<ul style="list-style-type: none"> <li>Conducive agricultural policy environment</li> </ul>	Key partners, stakeholders, institutions in the A4NH focus countries are increasingly	2019 extended to 2021 - 10 stakeholders engage in	Completed	<p>In Bangladesh, FP1 has engaged with the General Economic Division (GED) of the Bangladesh Institute of Development Studies and Deltares, an independent institute for applied research in the field of water and</p>	<a href="#">Affordability of Healthy and</a>

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FP Outcomes	Sub-DOs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
institutions (including national and local policy makers, private sector, consumer organizations, and other CRPs) are effectively implementing the evidence and lessons learned at scale in their food system related strategies and policy agenda	<ul style="list-style-type: none"> <li>Enhanced institutional capacity of partner research organizations</li> <li>Increased capacity for innovations in partner research organizations</li> </ul>	implementing the evidence and lessons learned at scale in their food systems related strategies and policy agendas. FP1-generated evidence in Phase II has been disseminated through the Food Systems Resource Center and the Food System Idea Exchange, which were fully operational in 2021. Several stakeholders, including government ministries, used FP1 results in the lead-up to the UN Food Systems Summit, in particular, as part of what was called, a solution cluster on a country-driven support facility for food systems pathways. Progress towards this outcome is described in our OICR.	participatory scenario analysis in at least 2 focus countries		subsurface. A stakeholder workshop is scheduled to take place in March 2022. At the time of this report, resources were not yet available online so we have not provided any links to available evidence from Bangladesh. In Nigeria, FP1 (through Wageningen University and Research), Tufts University, and the Federal Ministry of Agriculture and Rural Development (FMARD) in partnership with an ongoing project called Food Prices for Nutrition have been engaged stakeholders in analysis around food prices. A webinar was held in November 2021 to share findings under the theme "Food Prices for Nutrition in Nigeria: Tracking the cost and affordability of healthy diets." Daniel Mekonnen, WUR, presented a quantification of metrics for affordability of recommended diets at state-level using information from the Nigeria Living Standards Survey 2018-2019, one of the food systems diagnostic tools developed under FP1 during Phase II of A4NH.	<a href="#">Sustainable Diets in Nigeria</a>  <a href="#">Policy note</a>  <a href="#">Webinar</a>
			2021 - At least four policymakers (e.g., ministries, divisions) from the four focus countries consider A4NH evidence on appropriate policy levers for supporting healthier food systems in their countries	Completed	This milestone was achieved in 2021 largely in relation to the FP1 support provided, in particular, to the National Dialogues in the lead-up to the United Nations Food Systems Summit (UNFSS), which is described in more detail in the OICR. Within the four focus countries, the following ministries were the ones with whom FP1 researchers were most engaged. In Bangladesh, this was the Ministry of Food, alongside the Food and Agriculture Organization of the United Nations and the Global Alliance for Improved Nutrition. In Ethiopia, this was the Ministry of Health and the Ministry of Agriculture. In Viet Nam, this was the Ministry of Agriculture and Rural Development. Links point to documents where A4NH researchers contributed even if they are not acknowledged. FP1 researchers were less involved in the national UNFSS processes in Nigeria. However, through a separate stream of A4NH funded work, a recent brief described how a policy shift to focus on consumer needs can transform the agrifood system to deliver healthier and more affordable diets for all Nigerians, as well as better and more secure rural livelihoods.	<a href="#">UNFSS official feedback</a>  <a href="#">Pathways-Bangladesh</a>  Ethiopia: <a href="#">Background paper</a> ; <a href="#">Summit Dialogues</a> ; <a href="#">Conceptual framework</a> ; <a href="#">Technical report</a> ; <a href="#">Position paper</a>  <a href="#">Summit Dialogues - Vietnam</a>  <a href="#">Policy brief - Nigeria</a>
			2021 - Synthesis of A4NH cross-country evidence and lessons learned from food systems approaches compiled for the four focus countries	Partially Complete	There was a lot of investment in 2020-2021 in synthesizing FP1 work. Outputs were shared through the Food Systems Resource Center and Food Systems Idea Exchange, however, we consider this only partially completed because our dissemination plans to key stakeholders were cut short because of time and resources. Completed studies in 2021 included: (i) lessons learnt	<a href="#">FSRC FSIE</a>  <a href="#">Lessons learnt from policy baselines</a>

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FP Outcomes	Sub-DOs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
			and disseminated to key stakeholders		from the focus country food policy baseline studies; (ii) a "learning journey" which identified key lessons from the flagship that could be used in the formulation of future research programs aiming to transform food systems for healthier and sustainable diets; (iii) a desk-based study on the opportunities for accelerating food systems innovations for healthier diets in Viet Nam, with potential wider application; and (iv) a report on public-private partnerships. In addition, donor reports on fruit and vegetable production and consumption were used to develop a multi-donor initiative on fruits and vegetables. The International Fund for Agricultural Development (IFAD)'s 2021 Rural Development Report incorporated more FP1 synthesis on different aspects of food system transformation and two implementing partners used FP1 evidence as part of the expansion of their portfolio of tools on dietary assessments. Most of the evidence links require a password to access.	<a href="#">Learning journey</a> <a href="#">Opportunities in Vietnam</a> <a href="#">Public-private partnerships</a> <a href="#">IFAD Report</a> <a href="#">Background papers for IFAD</a>
		2020 extended to 2021 - 12 stakeholders across the 4 focus countries use results of systematic assessment of different scaling and anchoring options for food systems		Completed	One of our 2021 OICRs summarizes how stakeholders have used the evidence generated by FP1, in particular, as part of the National Dialogues in the lead-up to the United Nations Food Systems Summit (UNFSS). FP1 researchers were involved in supporting what is called a solution cluster or a proposal for establishing a globally networked, country-driven support facility for food systems pathways, as a means to achieve the goal of transforming food systems. Participants in the UNFSS Dialogues expressed demand for a mechanism to support each of them on their unique but aligned journey to food systems transformation. The idea is that the facility will operate as a global network of national-level platforms coordinated by national government-designated individuals. Through this process, existing local, state, county, and or national-level food systems-related plans and strategies will be reviewed. Then, through further stakeholder engagement, recommendations on policy, strategy, monitoring and evaluation will be provided to the respective public administration (local, regional, national, etc). The facility will also provide a conduit for connecting countries (at the national, regional, and local levels) to share experiences and exchange know-how. FP1 researchers supported inputs into this solution cluster with implementation ongoing after A4NH ends.	OICR – “ <a href="#">MARD incorporated A4NH evidence in implementation of nutrition-sensitive agriculture approaches in Viet Nam as part of their National Action Plan for Zero Hunger</a> ”
		2021 - Key platforms in two A4NH countries are active in anchoring food system approach and thinking for healthier diets		Completed	Multi-stakeholder platforms in Bangladesh, Ethiopia, Nigeria and Viet Nam have been trained to use a food systems decision-making tool co-developed by A4NH researchers. The first two evidence links provide more details for this activity. The third link goes to an internal report describing potential for anchoring in Ethiopia (password is required to access). More specifically, in Ethiopia, the Food and Nutrition Research Directorate of the Ethiopian	<a href="#">MSP</a> <a href="#">Multi-stakeholder platforms driven by consumer</a>



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FP Outcomes	Sub-DOs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
					Public Health Institute (EPHI) has been contextualizing the national Food-Based Dietary Guidelines (FBDGs) for pastoralist settings, an ongoing process in 2021 that will continue until after A4NH ends. In Viet Nam, the National Institute of Nutrition (NIN) has embraced the notion of healthier diets and have used FP1-developed tools such as the Healthy Eating Index more and more in their own work. A link to a conference poster is provided for context. Manuscripts are in the publication process.	<a href="#">concerns and public demands</a>  <a href="#">FBDGs in Ethiopia</a>  <a href="#">HEI - Vietnam</a>
FP2 Outcome: High-yielding micronutrient enhanced varieties developed and released in priority countries	<ul style="list-style-type: none"> <li>Increased availability of diverse nutrient-rich foods</li> </ul>	In 2021, in HarvestPlus target countries there were second and third wave releases, and in other (priority) countries there were first and in some cases second wave releases. Detailed list of releases will be available on the varietal released app which will be launched as part of the new website in 2022 after A4NH has ended.	2021 - All HarvestPlus Phase 1 countries ('target') release full target varieties and HarvestPlus Phase 2 countries ('priority') have tier 1 crops in release pipelines	Partially Complete	Even though there were delays due to the global pandemic, as of November 2021, there were 21 new varieties released (21 innovations). An updated varieties released map - by year, crop, and country - is now available to the public.	<a href="#">Varieties released map</a>
FP2 Outcome: Biofortification mainstreamed into CGIAR and NARS breeding efforts	<ul style="list-style-type: none"> <li>Increased capacity of partner organizations, as evidenced by rate of investments in agricultural research</li> <li>Enhanced institutional capacity of partner research organizations</li> </ul>	The indicators for monitoring mainstreaming of biofortification at CGIAR breeding centers were fine-tuned. However, uncertainty in resources and the exit of one of the important centers for biofortification (namely ICRISAT) from CGIAR meant that mainstreaming work was deprioritized by CGIAR Centers in 2021. HarvestPlus worked closely with Excellence in Breeding (EiB) in identification of market segments by region and development of target product profiles (a set of key traits required in the ideal product in a market segment to meet/exceed grower and consumer needs). Relatedly,	<p>2021 - NARS in HarvestPlus Phase 1 ('target') countries incorporated biofortification breeding and micronutrient analysis into national programs and NARS selected developed varieties.</p> <p>2021 - Mainstreaming monitoring reports for each crop (rice, wheat, beans, and pearl millet) for 2021</p>	<p>Completed</p> <p>Changed</p>	<p>In 2021, A4NH commissioned an external review on HarvestPlus' contribution to the development of national biofortification breeding programs in Bangladesh for zinc rice, India for iron pearl millet, and Rwanda for iron beans. Two of the questions for the study were how and to what extent did HarvestPlus contribute to the establishment and implementation of sustainable biofortification breeding programs in Bangladesh, India and Rwanda and what are the implications of this evaluative review for how CGIAR researchers work with NARES on breeding programs for biofortified crops. The study documents the HarvestPlus investment in national partners to undertake biofortification breeding since 2009 in the three countries and concludes that without this funding, it is highly unlikely that the biofortification breeding programs would have been set up. In addition, HarvestPlus facilitated a large amount of training and capacity development across the three value chains in two main areas: for breeding and for value chain actors. Much of the capacity development targeting end users (producers and consumers) happened as part of the communications strategy.</p> <p>In 2021 HarvestPlus faced a significant cut (67%) in its budget allocated for the targeted breeding and crop development component. Moving forward development of roadmaps will be an effort driven by the new Genetic Gains workstream in CGIAR with information from market intelligence. This activity</p>	<p><a href="#">External review report</a></p> <p><a href="#">Transition From Targeted Breeding to Mainstreaming</a></p>

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		HarvestPlus and EiB worked to establish micronutrient traits and harmonize the target level concept.			was beyond the control of HarvestPlus, although HarvestPlus has provided suggestions on how to carry it forward. As a commitment to mainstreaming by CGIAR, breeding for micronutrient content was included in the initiatives under Genetic Gains, although biofortification may not be included in all sectors/profiles. For the link to evidence, a publication on how HarvestPlus suggested mainstreaming should be done is provided.	<a href="#">of Biofortification Traits in Crop Improvement Programs</a>
FP2 Outcome: High-yielding micronutrient enhanced varieties delivered at scale in priority countries	<ul style="list-style-type: none"> <li>• Closed yield gaps through improved agronomic and animal husbandry practices</li> <li>• Increased availability of diverse nutrient-rich foods</li> </ul>	As a result of HarvestPlus delivery efforts, nearly 8.4 million farming households were reached with biofortified planting material and an estimated 12.7 million households, (translating to an estimated 63.9 million people) were growing and consuming biofortified crops in 2021. In addition to the households growing biofortified crops, there were increased sales of biofortified products in 2021. It is likely that more people are consuming biofortified products through the market and therefore more people with reduced micronutrient deficiencies than have been accounted for in the latest data.	2021 - 12 million households in HarvestPlus priority countries growing and consuming biofortified crops	Completed	An estimated 12.7 million households were growing biofortified crops in 2021, which translates to an estimated 63.9 million people, at the farm household level, benefiting from biofortified crops. The estimates are based on the Global Households Reached Projection Model. The links to evidence point to two internal documents describing the model and its methodology (password required to access).	<a href="#">GHRP Model Methodology</a>
FP2 Outcome: Evidence on nutritional efficacy and impact informs value chain actors, as well as national and international investors	<ul style="list-style-type: none"> <li>• Increased access to diverse nutrient-rich foods</li> <li>• Improved capacity of women and young people to participate in decision-making</li> <li>• Increased capacity of partner organizations, as evidenced by rate of</li> </ul>	In 2021 several lessons learned studies were conducted on delivery models and shared through various avenues, like blogs, videos, and publications. Significant progress was made in research on the health outcomes of consuming biofortified crops. Vitamin A maize was found to improve the vitamin A content in lactating mothers' breast milk. Iron pearl	2021 - 1-2 decision-making tools incorporating evidence from an efficacy study of multiple biofortified crops in culturally acceptable combinations for women of child-bearing age and for children 6-24 months of age and their lactating mothers 2020 extended to 2021 - Ex ante impact and cost-effectiveness analyses of all	Completed	Two videos were developed to guide decisions on incorporating biofortified crops in national food programs and are publicly available on YouTube. The short version is 2 minutes and the longer one is 4 minutes. The videos aim to inform decisionmakers and program managers in India about the nutritional benefits of biofortified foods and how they can be integrated into national food programs. Accompanying the videos, a short series of talking points and a slide deck were prepared to assist in advocacy efforts. (Password is required to access the links.)	<a href="#">2-min video</a> <a href="#">4-min video</a> <a href="#">Talking points</a> <a href="#">Slide deck</a>
				Cancelled	This large piece of work could not be completed before A4NH ended. For A4NH's work on biofortification, led by HarvestPlus, a high percentage (90%) of resources came from bilateral funding. CRP funding has been able to	

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	investments in agricultural research	millet was found to improve physical activity among adolescent school children. Research demonstrated the potential impact of zinc biofortification on reducing the risk of non-communicable diseases. The iron beans effectiveness study was completed; findings show significant increase in iron intake among adolescent girls.	target crop-country combinations are updated and published		leverage this for evaluation. Given greater than expected reductions in bilateral funding for biofortification during Phase II, the scope of the work that this analyses was able to inform was more limited than previously planned, but useful for an important subset of the evidence on zinc. An ex-ante analyses was published in 2010, plus an updated paper, published in 2018, on the ex ante models. The idea was to update this analyses, comparing it to other interventions addressing micronutrient malnutrition to assess whether the approach still makes sense. The updated analyses was to rely on new data on biofortification, including cost, adoption, variety performance, and externally generated, data on micronutrient malnutrition in relation to burden of disease. It's possible that the research will continue and be completed after A4NH the end of A4NH. We report this milestone as cancelled because not enough progress was made in 2021 to consider it partially complete.	
			2020 extended to 2021 - Lessons learned on delivery of the biofortified crops along the value chain in Nigeria, Bangladesh, India pearl millet summarized and published	Changed	Since the POWB2021 was submitted, Bangladesh was replaced with Uganda. Lessons learned from large-scale delivery strategies in Nigeria, Uganda, and India were summarized in a paper published in Food and Nutrition Bulletin. The authors conclude that the impact of biofortification ultimately depends on the development of sustainable markets for biofortified seeds and products and results illustrate the need for context-specific, innovative solutions to promote widespread adoption. A deep dive on the 16-year experience in Uganda was summarized and published online. A deep dive examination of the experience in Nigeria is expected to be published in a peer-reviewed journal next year, after A4NH has ended. Furthermore, a paper was written on the experience of developing and delivering biofortified crops in the Latin America and the Caribbean region, which is also expected to be published next year.	<a href="#">Scaling Up Delivery of Biofortified Staple Food Crops Globally</a>  <a href="#">Experience in Uganda</a>
F2 Outcome: Biofortification supported by global institutions and incorporated into plans and policies by stakeholders	• Conducive agricultural policy environment	The support for biofortification as a solution to hidden hunger continues to grow at the international, regional, and national levels. Specifically in 2021, we report on documented strategies in Uganda and Nigeria to increase adoption of biofortified crops. In addition, the Global Child Nutrition Foundation reported that school meals around the	2019 extended to 2021 - Biofortification included in World Health Organization (WHO) guidelines on micronutrient deficiencies	Cancelled	After discussion with the director of the nutrition and food safety department at the World Health Organization (WHO), the team agreed not to pursue the development of an official WHO evidence-based guideline on micronutrient deficiencies. What HarvestPlus has continued with WHO has been work on the Cochrane Systematic Review of evidence on the impact of biofortified crops. The protocol was published in 2016 ( <a href="https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD012311/iinformation#history">https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD012311/iinformation#history</a> ). The target date (Dec 2021) for publication of the systematic review and meta-analysis was not met largely due to lack of human resources and because this particular nutrition-sensitive intervention is not a high priority for WHO at the moment. The research team will continue the work and publish the review after A4NH has ended. This	

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		world are a somewhat underutilized channel for providing key micronutrients to children and suggested awareness raising around biofortified foods as a solution. Milestones for 2021 around tools, publicly available standards, and partnerships with United Nation agencies demonstrate how HarvestPlus work is contributing to this outcome.			systematic review published by the Cochrane Group, upon commission and with endorsement from the WHO, is expected to add significantly to the effectiveness of advocacy within ministries of health of target countries. HarvestPlus, public, private, and civil society organizations, and CGIAR centers working on biofortification will see their capacity increased to work with the health sector using this resource. HarvestPlus provided financial support for and technical review of the protocol.	
			2021 - Standards for the zinc levels of the biofortified grains (by collaborating with our partners), publicly available.	Completed	The first standard for increased zinc content in wheat, maize and rice grain for food for human consumption was published by British Standards Institution (BSI). This standard for zinc biofortified grains and foods (rice, wheat and maize) was developed by a steering group of international experts in government, plant & crop sciences, grain procurement and academics. It was sponsored by HarvestPlus through a partnership is funded by the German Federal Ministry for Economic Cooperation and Development, and the Government of the Netherlands. For this process, HarvestPlus presented the portfolio of CGIAR-generated evidence on zinc biofortification. Standards are developed by dedicated panels of experts, within technical committees, facilitated by BSI. A standard undergoes various stages of development, beginning with the Proposal stage, which is aimed at affirming the market need for a standard. Once a proposal for a standard is approved, the relevant panel of experts in the area drafts the standard. As soon as a draft is mature enough, it undergoes public consultation when it is made available for anyone to view and comment. Standards are expected to contribute to the commercializing and scaling of zinc biofortified foods. Similarly standards for iron biofortified crops were also published in 2021.	<a href="#">Announcement on HarvestPlus website</a>  <a href="#">Publication of standard</a>  <a href="#">More details on the process</a>
			2021 - Biofortification Priority Index (BPI) 2.0 database is updated with new varieties released data	Completed	HarvestPlus developed the Biofortification Priority Index (BPI) in 2013 to inform the biggest bang for the buck investments in biofortification. The BPI ranks 128 low- and middle-income countries according to their impact potential for investment in each of the 13 biofortified staple food crops. It is a one-stop-shop for anyone interested in investing in biofortification. In 2021, the Biofortification Priority Index (BPI) 2.0 database was updated with new varieties released data and the latest evidence on impact. Not only does BPI 2.0 include maps for each crop, it has three subindices on production, consumption, and micronutrients. For example, the the micronutrient deficiency subindex measures the prevalence of each micronutrient deficiency in a country. The variables used for each micronutrient's subindex reflect the prevalence and consequences of the deficiency if uncorrected. There is also a weighted BPI. For countries that are larger in area or	<a href="#">BPI</a>

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					population, or both, may offer greater opportunities for higher production volumes or to reach more people with biofortification. The BPI 2.0 calculates two alternative indices that take land area and size of the target population into consideration. In both cases, a country's unweighted BPI ranking is offered for comparison with the weighted ones.	
FP3 Outcome: Key food safety evidence users (donors, academics, INGOs, national policymakers, civil society, and industry) are aware of and use evidence in the support, formulation and/or implementation of pro-poor and risk-based food safety approaches	<ul style="list-style-type: none"> <li>• Reduced market barriers</li> <li>• Reduced biological and chemical hazards in the food system</li> <li>• Appropriate regulatory environment for food safety</li> </ul>	<p>Over the course of Phase II, A4NH researchers have generated new evidence that helped to change research and development priorities alongside the donor landscape for food safety. The German government made several key investments in 2021 described in more detail in the milestone. In addition, with the East African Community, the Food and Agriculture Organization of the United Nations, and Lloyds Foundation, ILRI continued to support the development of university-level food safety curriculum. Efforts by IITA have raised awareness of and interest in Aflasafe; in particular, how their five-step science to scale process brings Aflasafe to more markets across Africa.</p>	2021 - Donors make significant investments in pro-poor and risk-based food safety approaches, based on A4NH evidence, in at least two countries	Completed	<p>In 2021, A4NH scientists were engaged in initiating and implementing new initiatives funded by the German government. Phase 3 of the Pandemic Preparedness project between the East African Community (EAC) and GIZ will include food safety. (Link describes Phase 2; Phase 3 yet not online.) ILRI researchers were invited to join the appraisal mission, bringing their expertise on food safety and informal markets and ongoing engagement with the EAC food safety desk, to pandemic preparedness at the regional and national government levels (links 2 and 3; password required). Albeit not donors, other food safety evidence users were made aware of A4NH evidence or incorporated it into their programming. A4NH scientists were invited by the private sector (Livestock Industry Grow Asia and Enterprise Ireland) to co-host a roundtable discussion. The session centered around providing Irish agritech companies with information on how to navigate the region's diverse markets, especially given the complexities of COVID-19. In another example, A4NH scientists provided expertise to the World Health Organization (WHO) in a bi-regional advocacy meeting on risk mitigation in traditional food markets in Western Pacific and Southeast Asia and helped to revise a WHO manual to support risk assessment and mitigation in traditional food markets.</p>	<a href="#">Project website</a> Appraisal mission – <a href="#">link 1</a> and <a href="#">link 2</a> <a href="#">Grow Asia round table</a> <a href="#">ILRI coverage</a> <a href="#">Presentation</a>
			2021 - Regulators in 11 countries in Africa approve registration of 14 Aflasafe products based on A4NH-generated evidence of efficacy and safety of the products	Changed	<p>By the end of 2021, 14 Aflasafe products were registered for use in 10 countries (not 11) - Nigeria, Kenya, Senegal, The Gambia, Burkina Faso, Ghana, Zambia, Tanzania, Malawi, and Mozambique - which is why we report this milestone as changed. Products are registered for use in maize, plus with variations by country, also in groundnut and sorghum, In addition, product registration for use in Rwanda and Mali in maize and groundnut had reached advanced stages in the registration pipeline. A4NH researchers from IITA conduct field efficacy trials of Aflasafe alongside national partners. The trials are an important part of the process to prepare Aflasafe products for registration.</p>	<a href="#">Present Status and Perspective on the Future Use of Aflatoxin Biocontrol Products</a> <a href="#">Development and scale-up</a> <a href="#">Aflasafe website</a>
			2021 - Public and private stakeholders in Kenya, informed by A4NH evidence and lessons learned, draft a national aflatoxin	Completed	<p>The report, "Strategy for Enhancing Production and Use of Aflasafe KE01 in the Management of Aflatoxins for Food and Feed Safety in Kenya" was drafted and validated in 2021. The links to supporting evidence point to the strategy, plus documents regarding the validation process, which require a password to access. As explained in the foreword: "Aflasafe KE01™ is the</p>	<a href="#">Strategy for Kenya</a> <a href="#">Validation workshop agenda</a>

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			management strategy and deliberate to validate a strategy for scaling out Aflasafe™		first Pest Control Products Board-approved practical product available to Kenyan farmers for aflatoxin control at the pre-harvest stage. This strategy provides a roadmap towards enhancing production, promotion and use of Aflasafe KE01....to be achieved through increased awareness and capacity on use of the product to combat the negative effects of aflatoxins, enhanced production of high quality Aflasafe KE01 for management of aflatoxins, and enhanced adoption of the product through promotion, marketing and distribution among stakeholders. IITA is acknowledged as a key partner in the development of Aflasafe KE01 and this particular strategy.	<a href="#">Validation workshop</a>
FP3 Outcome: Market-based food safety innovations delivered at scale in key countries along with understanding of their impact and appropriate use	<ul style="list-style-type: none"> <li>• Reduced biological and chemical hazards in the food system</li> <li>• Appropriate regulatory environment for food safety</li> <li>• Increase capacity of beneficiaries to adopt research outputs</li> </ul>	A4NH researchers continued testing and scaling food safety interventions in six countries, work which will continue after A4NH ends. The approach includes engaging stakeholders applying the ‘three-legged stool’ approach: (1) training and technologies, which include awareness raising; (2) the enabling environment, meaning that regulatory authorities have to be on board with the intervention and there has to be some mechanism for institutionalization and a means of quality assurance; and (3) motivation and incentives, which are essential but context specific. The approach has potential to improve food safety at scale and progress during 2021 is described more in the milestone.	2021 - Value chain actors in at least two countries endorse, adapt or start using elements of the A4NH ‘three-legged stool approach’, particularly related to capacity building and compliance, in their own food safety systems	Completed	In Cambodia, a task force for food safety risk assessment comprising policymakers and researchers from research institutes and universities, was established through A4NH support and has implemented a number of evidence-based strategies to improve food safety. Ten short-term trainings have been held to date plus at least 7 undergraduates and 4 postgraduate students have undertaken or supported food safety research projects in Cambodia. The evidence links describe the activities of the task force and summarize other activities in Cambodia related to this bilaterally-funded project on food safety, which ended in 2021. In India, ILRI researchers continued to support the World Bank-funded Assam Agribusiness and Rural Transformation Project (APART), led by the Animal Husbandry and Veterinary Department (AHVD) of the Government of Assam. The manuals co-developed by A4NH researchers, were used for trainings in Assam targeting tens of thousands of value chain actors over the course of 2021. ILRI also continues to provide technical support to food safety labs and has established a joint coordination committee for milk and pork safety in India. The evidence links point to ILRI information and promotional materials on this topic.	<a href="#">Presentation</a> <a href="#">Final workshop report</a> <a href="#">ILRI promotes work with Government of Assam</a> <a href="#">ILRI newsletter re: work in India</a>
FP3 Outcome: Biocontrol and GAP delivered at scale in key countries along with understanding		During the last year of A4NH, IITA researchers and partners continued scaling the Aflasafe technology in 10 countries through public-private partnerships and innovations	2021 - More than four-fold increase from 2017: 450,000 hectares covered with Aflasafe and more than 300,000 farmers adopt biocontrol	Completed	The targets for the 2021 milestone were exceeded. More than 5,400 tons of Aflasafe have been produced thus far. This was enough to treat 540,000 hectares (ha) of susceptible crops (maize, groundnut, and sorghum). More than 350,000 farmers adopted Aflasafe in 10 African countries. What is more important is that the majority of the crops were produced with safe aflatoxin content. Around 1 million tons of safe crops were produced through use of	<a href="#">Book chapter on approach and progress to date</a>



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of their impact and appropriate use		that allowed producing and using biocontrol and good agricultural practices (GAP). Several partners across the ten countries - Nigeria, Ghana, Burkina Faso, Tanzania, Senegal, The Gambia, Mozambique, Malawi, Mali, Kenya - were supported in 2021 to scale up the biocontrol technology. CGIAR's development, testing, registration of new products will continue under the new Plant Health Initiative. The scaling of Aflasafe products and other management practices will also continue under the Plant Health Initiative.	across eight countries in Sub-Saharan Africa		aflatoxin management strategies centered on biocontrol. The increase in usage was driven by support from the public sector (e.g., Central Bank of Nigeria in Nigeria) and private sector (e.g., Saphyto in Burkina Faso and AflaLivre in Mozambique). In Nigeria, commodity associations and manufacturing licensee advocated for critical policy changes that increase the use of Aflasafe.	
			2021 - Cumulatively since 2017, at least 50 public sector agencies and agri-businesses in sub-Saharan Africa adopt mitigation technologies (Aflasafe, post-harvest practices and aflatoxin testing) for reducing aflatoxin in crop value chains; at least three of these initiatives have a major emphasis on women	Completed	Through IITA-led projects and initiatives, at least 57 public sector agencies and agri-businesses have adopted aflatoxin mitigation technologies, such as Aflasafe. Currently, there are 5 active private sector distributors: UPL-Callighana (in Ghana); Saphyto (in Burkina Faso); Agro-Input Suppliers Limited (in Malawi); UPL-MPC (in Mali), and the newest one in 2021, AflaLivre (in Mozambique). Currently, there are 4 companies licensed to manufacture Aflasafe products: Harvestfield Industries (in Nigeria), BAMTAARE (in Senegal and The Gambia), A to Z Textile Mills (in Tanzania), and Koppert (in Kenya). In Nigeria, 32 private sector aggregators and grain traders (known as implementers) provided Aflasafe to smallholder farmers to improve maize quality and obtain better market prices, as part of an AgResults project called the Nigeria Aflasafe Challenge Project. On top of these 41 private sector actors, there are 16 more farmer associations, companies, different levels of governments, UN agencies, and NGOs that have adopted Aflasafe as part of their business model, projects, or other initiatives in Burkina Faso, Nigeria, Ghana, and Kenya. The fourth link to evidence points to a donor report (password required to access); Sections 4.3 "Selection of investors and structure of partnerships" and 4.4 "Execution of the business plan" provide more details.	<a href="#">Infographic</a> <a href="#">New agreement announcement</a> <a href="#">Project site for AgResults</a> <a href="#">Donor report</a>
			2021 - Negotiations initiated or continued on agreements between IITA and public or private sector partners for manufacturing and/or distribution of Aflasafe in three countries in sub-Saharan Africa	Completed	In May 2021, IITA signed a Technology Transfer and Licensing Agreement (TTLA) with AflaLivre Moçambique S.A. (AflaLivre) to manufacture and distribute Aflasafe in Mozambique. The renewable agreement defines the framework of operations and responsibilities of each party. In addition, IITA's Aflasafe team provides ongoing technical assistance with the design of a new Aflasafe factory and procurement of the equipment. This Aflasafe manufacturing facility in Nampula, the fifth in sub-Saharan Africa, is expected to be operational by June 2022. The link to supporting evidence focuses on the progress in Mozambique. Also in 2021, IITA renewed the TTLA with Agro-Input Suppliers Limited in Malawi and new distribution agreements were made with UPL for distribution in Mali (under UPL-MPC) and in Ghana (under UPL Callighana). The existing TTLAs with companies in Senegal, Nigeria, Tanzania, Kenya, Burkina Faso were nurtured and continue.	<a href="#">Agreement signed for Mozambique</a>



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					IITA's Aflsafe team provides ongoing technical assistance to all the manufacturing and distribution partners.	
FP4 Outcome: Development program implementers and investors (governments, NGOs, UN institutions) use evidence, tools and methods to design and implement cost-effective nutrition-sensitive agricultural programs at scale	<ul style="list-style-type: none"> <li>Increased access to diverse nutrient-rich foods</li> <li>Optimized consumption of diverse nutrient-rich foods</li> <li>Gender-equitable control of productive assets and resources</li> </ul>	In 2020-2021, A4NH made targeted investments to assess how program implementers working in South Asia, Southeast Asia, and West Africa, have used A4NH evidence, tools and methods. An external evaluation of use of women's empowerment tools is featured in this year's milestone. A separate external review identified factors that facilitated and constrained a researcher-implementer partnership that could be useful for other, similar partnerships. One aspect that was unique was that the implementer prioritized learning, sharing, and applying lessons about its program's effectiveness.	2021 - Program implementers (governments, INGOs, NGOs, UN institutions) have increased understanding of (gendered) impact of nutrition-sensitive agriculture programs and improved capacity to use evidence, tools, methods in program design which will result in people in target countries benefitting from improved nutrition-sensitive programs.	Completed	Longstanding partnerships between IFPRI and the Government of Bangladesh have helped inform stakeholders of the successes of nutrition-sensitive agriculture programs and informed the design of nation-wide social assistance programs. Results from the evaluation of the Agriculture, Nutrition, and Gender Linkages (ANGeL) project showed that the programming model used by the Government increased both women's and men's empowerment, raised the prevalence of households achieving gender parity, and led to small improvements in the gender attitudes of both women and men. An external evaluation of two A4NH innovations, the project-level Women's Empowerment in Agriculture Index (pro-WEAI) and the Reach, Benefit and Empower, Transform framework, found that even though both tools are relatively new, their use in projects is growing and they have contributed to changes in project priorities and in how agricultural projects seeking to empower women are designed and evaluated. In particular, the focus on women's empowerment was enhanced because the tools helped improve understanding of what women's empowerment means in project settings. A second external evaluation (unpublished at this time) documented and analyzed two researcher-implementer partnerships between IFPRI and Helen Keller International and the World Food Programme, including their history, formation, outputs, and outcomes, to raise awareness about and improve understanding of high-quality researcher-implementer partnerships.	<a href="#">Experimental evidence from Bangladesh</a> <a href="#">Evaluation report</a>
FP4 Outcome: Researchers and evaluators, including in CGIAR and other CRPs, use evidence, tools and methods to design high-quality evaluations of a range of nutrition-sensitive agricultural and other multisectoral programs, and continue to build evidence	<ul style="list-style-type: none"> <li>Enhanced institutional capacity of partner research organizations</li> <li>Enhanced individual capacity in partner research organizations through training and exchange</li> <li>Increased capacity for innovation in partner development organizations and in</li> </ul>	The outcome describes work to build capacity for researchers to use A4NH-generated evidence in their evaluative work. In 2021, A4NH researchers launched the first module in the Project-level Women's Empowerment in Agriculture Distance Learning Course. Numerous initiatives will support uptake that will continue after A4NH ends. In 2020-2021, A4NH made targeted investments to assess how researchers have used	2021 - Researchers use A4NH tools and methods generated from program evaluations in their own evaluations of a range of nutrition-sensitive agricultural and other multisectoral programs is documented.	Completed	In 2021, the project-level Women's Empowerment in Agriculture Index (pro-WEAI) Foundations Module, the first in the pro-WEAI Distance Learning Course was launched. A new project, Applying New Evidence for Women's Empowerment, will promote use of the growing portfolio of tools after A4NH ends. This builds on the project-level WEAI for Market Inclusion (pro-WEAI+MI). A4NH researchers and FAO co-authored a review on the effectiveness of social assistance programs, such as agriculture asset transfers and school meals programs, for reducing all forms of malnutrition within a food systems framework. The paper outlines clear evidence of positive impacts on women's and children's diet-related outcomes, how future programming can be designed to benefit target populations, as well as recommended indicators to best measure impact. Finally, the external review of the use of the program impact pathway (PIP) approach, a framework mainstreamed in most of A4NH's evaluations of nutrition-sensitive agriculture (NSA) projects, found that respondents valued the PIP	<a href="#">Pro-WEAI Distance Learning Course</a> <a href="#">Review</a>

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FP Outcomes	Sub-IDOs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
	poor and vulnerable communities	A4NH evidence, tools and methods in their evaluative work. One examined how and to what extent approaches for the design, implementation, and evaluation of programs — specifically the program impact pathway (PIP) approach — have influenced the broader field of program evaluation.			approach for its ability to fill in gaps in the story of how a program worked and recognized its value in identifying relevant intermediate indicators. The not yet published study did not document the extent to which PIPs have been used in evaluations outside of A4NH.	
FP4 Outcome: Regional, international and UN agencies and initiatives and investors use evidence, tools and methods to inform decisions and investment strategies to guide and support nutrition-sensitive agricultural programming and nutrition-sensitive policies	<ul style="list-style-type: none"> <li>Increased access to diverse nutrient-rich foods</li> <li>Optimized consumption of diverse nutrient-rich foods</li> <li>Improved capacity of women and young people to participate in decision-making</li> </ul>	The 2021 United Nations Food Systems Summit (UNFSS) and 2021 Nutrition for Growth both provided numerous opportunities for a wider audience to become aware of and use A4NH evidence, tools, and methods around nutrition-sensitive agriculture programming and policies. The 2021 milestones focus on how regional and international-level actors are using A4NH evidence to shape country-level actions with several examples of how A4NH is working successfully as a knowledge partner of the UN.	2020 extended to 2021 - Regional and international organizations incorporate new knowledge/approaches on climate change and gender relations in their discourse, attitudes, behaviors, and practices related to cross-sectoral nutrition-sensitive agriculture	Changed	We report this milestone as changed. Even though FP4 maintained focused on ongoing multisectoral nutrition sensitive and agriculture programs, many did not have a climate change focus. Research was published in 2021 on how climate change interacts with inequity to affect nutrition, but this research area has not grown in such a way that we could claim A4NH has strengthened the capacity and knowledge of organizations on that topic. Other 2021 milestones for this flagship describe well how others are using A4NH evidence on gender, so we do not repeat that here. However, in regards to the broader multisectoral nutrition agenda, A4NH researchers contributed to a special Lancet series issue, which outlined an agenda for action, to mobilize evidence, data and resources to achieve global undernutrition and Sustainable Development Goal targets, with A4NH evidence on gender- nutrition- and health-sensitive studies. The article concludes with a call to action for the 2021 Nutrition for Growth Summit to unite global and national nutrition stakeholders around common priorities to tackle a large, unfinished undernutrition agenda.	<a href="#">How climate change interacts with inequity to affect nutrition</a>  <a href="#">Agenda for action...to achieve global undernutrition targets and the SDGs</a>
			2021 - Key regional, international, and UN actors demonstrate changes in cross-sectoral actions and investments related to gender-nutrition- and health-sensitive development in five countries, which are aligned with A4NH evidence .	Completed	The demonstrated changes exceed the five country target set for 2021. We focus on four examples with United Nations (UN) actors. Engagement with the World Food Programme Sri Lanka continued. An A4NH-led impact assessment of their nutrition and welfare based social protection program will be completed after A4NH ends. A4NH researchers are co-designing a new project in Mali, Chad, Mauritania, and Niger with UNICEF. An A4NH researcher participated in the development of the Committee on World Food Security's Voluntary Guidelines on Food Systems on Nutrition, which were approved by member states in February 2021. The UN system, with inputs from A4NH, developed a knowledge platform to link country actors to expert documentation to guide action in the focus areas of the Guidelines. Separately A4NH developed a set of policy briefs to provide evidence-based recommendations for operationalizing the policies and programs highlighted	<a href="#">Evidence map on child wasting</a>  <a href="#">OICR on Voluntary Guidelines</a>  <a href="#">CFS Voluntary Guidelines</a>  <a href="#">Contributions to UNFSS</a>  <a href="#">OICR on UNFSS</a>

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FP Outcomes	Sub-IDs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
					in the Guidelines (to be launched in early 2022). More details are in the OICR. Lastly, A4NH partnerships laid the foundation for A4NH's support to the UN Food Systems Summit, in particular, to the Coalition on Health Diets from Sustainable Food Systems for Children, described in more detail in another OICR.	
FP4 Outcome: National policymakers and shapers, and stakeholders from different sectors, civil society and industry use evidence to design effective nutrition-sensitive policies, and ensure quality implementation	<ul style="list-style-type: none"> <li>Increased access to diverse nutrient-rich foods</li> <li>Optimized consumption of diverse nutrient-rich foods</li> <li>Improved capacity of women and young people to participate in decision-making</li> </ul>	There are many more examples of how A4NH evidence is being used by national policymakers than what is captured in this year's milestone. In Bangladesh, results from an evaluation of a government-led project suggested there are some potential benefits of bundling nutrition and gender components with agriculture; however, many of these benefits seem to be driven by bundling nutrition with agriculture. At the close-out event for Transform Nutrition West Africa, policymakers discussed a new agenda aimed at strengthening intersectoral partnerships and networks and using knowledge to accelerate policy and program actions to improve nutrition.	2021 - Body of evidence generated by national policymakers and cross-sectoral stakeholder engagements with A4NH in 20 "stories of change" case studies from 14 countries and 4 Indian states documenting drivers and pathways of nutrition-relevant change compiled and promoted.	Completed	The "stories of change" case studies shed light on the drivers and pathways of nutrition-relevant change -- with a particular focus on the determinants of political commitment, policy and program coherence, and effective implementation of nutrition-relevant actions. In 2021, A4NH researchers have been working with Food Security on a Special Issue compiling the multi-year effort, but publication has been delayed to 2022. However, Stories of Change was featured as one of the CGIAR's 50 years of innovations (1) and there is a dedicated page on the IFPRI website where all outputs are compiled and an interactive map for users to search outputs by geography (2). In addition, a well-attended virtual policy seminar in early-2021, provided practical insights, some from the stories of change work, on large-scale solutions to child undernutrition in different countries (3). Furthermore, lessons from several research programs, featured in The Lancet 2021 Series on Maternal and Child Undernutrition, offer hope that big change is possible and provide specific direction for countries striving to accelerate progress on nutrition.	<a href="#">CGIAR's 50 Years of Innovations</a> <a href="#">Interactive map</a> <a href="#">Policy seminar</a> <a href="#">The Lancet 2021 Series on Maternal and Child Undernutrition</a>
FP4 Outcome: Stakeholders from different sectors, governments, UN institutions, civil society and industry, including CGIAR and other CRPs, have improved capacity to generate and use evidence to improve	<ul style="list-style-type: none"> <li>Increase capacity of beneficiaries to adopt research outputs</li> <li>Enhanced individual capacity in partner research organizations through training and exchange</li> <li>Increased capacity for innovation in</li> </ul>	In Phase II, A4NH focused on building capacity to generate, use, and interpret nutrition data, as well as strengthening nutrition leadership capacity, or the ability to build commitments, broker agreements, or undertake strategic communications in regards to the nutrition agenda and working in multisectoral	2021 - A4NH capacity building efforts have increased the capacity of different African-based nutrition leaders and institutions to generate and use evidence to improve nutrition-sensitive agricultural programming, policymaking, and implementation of both is documented.	Partially Complete	A4NH's contribution to evidence generation and use has included engagement with the African Union, Comprehensive Africa Agriculture Development Program, Scaling Up Nutrition movement, and more (1). This work laid the foundation for A4NH's support to activities related to the United Nations Food Systems Summit (UNFSS) in particular, to the Coalition on Health Diets from Sustainable Food Systems for Children. Providing a synthesis of evidence on food systems and nutrition pathways across West Africa as well as in Ethiopia (3), contributed to successful dialogue and feedback during a facilitated session attended by more than 115 participants. In June, Transform Nutrition West Africa virtually convened nutrition stakeholders to discuss an emerging agenda aimed at using	<a href="#">Stakeholder engagement Contributions to UNFSS</a> <a href="#">Evidence from West Africa</a> <a href="#">Convening on nutrition agenda in West Africa</a>

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FP Outcomes	Sub-IDs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
nutrition-sensitive agricultural programming, nutrition-sensitive policymaking and implementation.	partner development organizations and in poor and vulnerable communities	teams. To date, A4NH support to nutrition leadership development has been tackled through short courses, most of which were tied to larger, bilaterally funded initiatives with partners. The 2021 milestone describes these activities, which anecdotally have improved capacity, but a rigorous evaluation could not be completed before the end of A4NH.			knowledge to accelerate policy and program actions to improve nutrition in the region. Their short courses (5) were mentioned frequently by participants during the event and examples of how they used knowledge and skills gained were given. Lastly, member States endorsed the new Voluntary Guidelines on Food Systems and Nutrition in 2021, a process A4NH supported by mapping evidence that will help countries with implementation. We consider this milestone partially completed; a rigorous evaluation of all these efforts could not be completed before A4NH ended.	<a href="#">Short courses</a> <a href="#">Evidence platform for agrifood systems and nutrition</a>
FP5 Outcome: Agricultural practices modified to reduce health risks	<ul style="list-style-type: none"> <li>Increased resilience of agro-ecosystems and communities, especially those including smallholders</li> <li>Enhanced adaptive capacity to climate risks (More sustainably managed agro-ecosystems)</li> <li>Improved capacity of women and young people to participate in decision-making</li> </ul>	In Phase II, A4NH researchers demonstrated the substantial health risks caused by agricultural practices, rice farming in particular, contrary to the prevailing assumptions. Although publication has taken longer than initially expected, the strength of the evidence is stronger and more direct than expected. For example, in trials, A4NH researchers showed that alternate wetting and drying (AWD) irrigation in rice fields can help to suppress emissions of mosquitoes as well as greenhouse gases, but the effect on mosquitoes is incomplete and inadequate, and other supplementary anti-mosquito interventions will also be needed. The trials produced preliminary evidence on	2020 extended to 2021 - Preparation and dissemination of synoptic review of current knowledge and research gaps regarding landscape-mediated effects of agriculture on vector-borne disease to guide FP5 and other research	Partially Complete	This synoptic review reached final draft stage in 2021. It will be submitted for peer-reviewed publication in 2022, after A4NH ended. It is for this reason that we consider this milestone partially complete. The link points to the draft manuscript, evidence that is not publicly available, and requires a password to access.	<a href="#">Draft manuscript</a>
			2021 - Refined One Health action plans for Rift Valley fever are developed in Uganda based on risk map developed in 2020 and outputs from simulation models	Completed	Both the Ugandan Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) and Vétérinaires sans Frontières Germany (VSF Germany) have been using the Rift Valley fever (RVF) risk maps, co-developed by A4NH researchers, as part of their RVF surveillance activities in livestock. Control of RVF, a zoonotic disease transmitted by mosquitoes that is closely linked to a livestock reservoir (especially sheep and cattle) and sensitive to climate change, remains high on MAAIF's agenda. A4NH support to their improved surveillance included a series of trainings on participatory disease surveillance. This partnership will continue after A4NH ends as part of Boosting Uganda's Investments in Livestock Development (BUILD), a multi-year research-for-development project led by ILRI and funded by the German government. Activities commenced in Uganda in 2021, but were interrupted due to COVID travel restrictions and elections. Graduate fellows involved in fieldwork summarized preliminary findings (1). Stakeholder meetings have been held to discuss better ways of managing the disease based on the risk framework developed. Presentations given in these meetings include those on barriers to the use of RVF vaccines (2). Ongoing	<a href="#">Preliminary findings from fieldwork</a> <a href="#">Presentations to stakeholders</a> <a href="#">Capacity building efforts</a>

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FP Outcomes	Sub-IDs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
		promising candidate interventions.			efforts to enhance surveillance capacity that were initiated in 2020 continued in 2021 (3).	
			2021 - Rice irrigation schemes in at least one site in West Africa pilot wet/dry irrigation strategy to reduce mosquito and greenhouse gas emissions in their farms	Partially Complete	Three seasons of experimental trials have been conducted to test the effect of alternate wetting and drying (AWD) irrigation other candidate intervention strategies on mosquito abundance in rice fields. These trials showed that AWD can help to suppress rice field emissions of mosquitoes as well as greenhouse gases, but the effect on mosquitoes is incomplete and inadequate, and other supplementary anti-mosquito interventions will also be needed. Some promising candidate interventions, that could be complementary to AWD, have been identified. The trials have been funded mainly by a grant from the Wellcome Trust, with support from A4NH. The research team has a no-cost extension from the Wellcome Trust and will finalize the results for publication in the first part of 2022, after A4NH has ended. This is why this milestone is reported as partially complete. The link points to the draft manuscript, evidence that is not publicly available, and requires a password to access.	<a href="#">Draft manuscript</a>
FP5 Outcome: Agricultural and public health policymakers and implementers deliver coordinated and effective solutions to cysticercosis and other zoonotic threats	<ul style="list-style-type: none"> <li>• Reduced livestock and fish disease risks associated with intensification and climate change</li> <li>• Increased resilience of agro-ecosystems and communities, especially those including smallholders</li> <li>• Conducive environment for managing shocks and vulnerability, as evidenced in rapid response mechanisms</li> </ul>	A4NH has partnered with local and international institutions in the development of a One Health strategic plan for Kenya, which includes porcine cysticercosis and brucellosis. Scientists have been part of the national task force that contributed A4NH evidence and experience to the development of this document. Specifically, research from western Kenya and Uganda on consumer knowledge and hygiene practices in production and meat inspection were incorporated into the strategy. Approaches for surveillance and screening for brucellosis were also guided by the team's research work. The strategy will be officially launched before the end of 2021.	2018 extended to 2021 - Stakeholders (farmers and field veterinarians) have access to a validated and semi-commercialized pen-side diagnostic assay for cysticercosis	Partially Complete	A prototype pen-side diagnostic kit for use in pigs was developed, and reached end of piloting in 2018, but based on poor results, it was moved back to proof of concept with a different partner. Since, then A4NH researchers have been working to develop a new assay, which will provide real time information about the health status of an animal or herd. New data on the pilot results were generated and an internal report was prepared (password required to access). We consider this only partially completed because the assay is still undergoing validation runs in Rwanda. Work is expected to continue after A4NH ends.	<a href="#">Internal report</a>
			2021 - At least three county governments in Kenya are sensitized and guided to integrate the brucellosis surveillance and control strategy in their disease control plans	Partially Complete	Under several major bilaterally funded projects led by ILRI and in the A4NH portfolio, surveys were completed in 8 counties in Kenya where brucellosis (an infection spread from animals to people) is prevalent. Results were shared with stakeholders from local government. However, we consider this milestone partially complete because by the end of 2021, researchers were still recruiting focal points from these local governments who will co-develop and integrate One Health work plans in their own county disease control plans after A4NH ends. In addition, the National Strategy for Prevention and Control of Brucellosis in Humans and Animals in Kenya (2021-2040) has not been officially finalized. The link points to evidence that is not publicly available and requires a password to access.	<a href="#">Brucellosis Strategy</a>
			2020 extended to 2021 - Regional serum bank for cysticercosis test validation	Completed	The regional serum bank for cysticercosis is now operational. It is a disseminated serum bank based in multiple countries (primarily Kenya, Rwanda and Uganda) with a centralized index of samples available to	<a href="#">Current version of regional serum bank</a>



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FP Outcomes	Sub-IDs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
			created and made available to regional researchers		researchers as a resource. It has tremendous value in assessing the performance of new diagnostic assays, being the result of a fine dissection of pigs (both positive and negative) in multiple sites according to a standardized protocol. It has already been used for validation of a new assay, and will continue to be useful for researchers across sub-Saharan Africa with an interest in cysticercosis diagnosis. Ultimately, its availability will be disseminated through the World Health Organization. A more formal version of the database is under development, but an evidence link to the current version in use has been provided.	
FP5 Outcome: Public and private sector policymakers implement measures to reduce human and animal health risks from antimicrobial resistance and other interactions	<ul style="list-style-type: none"> <li>• Reduced livestock and fish disease risks associated with intensification and climate change</li> <li>• Increased safe use of inputs</li> <li>• Enhanced institutional capacity of partner research organizations</li> </ul>	Government partnerships were established with ministries in Kenya, Uganda, Bangladesh and Zambia through the CGIAR Antimicrobial Resistance (AMR) Hub and several bilaterally funded projects. This has led to laboratory and field surveillance capacity building and implementation of specific objectives of national action plans including raising awareness and co-developing and implementing AMR and antimicrobial use (AMU) surveillance among animals to ultimately reduce AMU and AMR at human-animal interfaces. A4NH researchers have been able to link and include AMR committees in regional and international initiatives, including a new One CGIAR initiative on One Health, and align them with government priorities.	2021 - Portfolio of AMR reducing interventions for the agricultural sector in LMICs including the tools for their selection (feasibility) and evaluation (impact)	Partially Complete	To date, there has been a lot of descriptive work, some published and some in the publication process, and some pilot studies to test different interventions and their efficacy. However, before A4NH ends, results on actual impacts remain in progress and therefore unpublished. Therefore, we report this as partially completed because this is a work in progress that will continue after A4NH ends. Research conducted by the CGIAR AMR Hub was largely conducted by ILRI's lab facility in Nairobi, supported by funds from the Fleming Fund. This included sample collection and screening, training and stakeholder engagements. Evidence generated is being used to develop CGIAR activities under a new initiative on One Health. In summary, the Hub led AMR-reducing activities in several countries through several sources of funding, several mapped to the CRP on Livestock, not A4NH. Highlights specific to A4NH include the work in Zambia under the Fleming Fund Fellowship to increase capacity development and in Viet Nam on nanosilver and probiotic trials. The evidence link points to work in commercial poultry production from Kenya. Moreover, smaller pilot studies were conducted to investigate the efficacy of nanosilver and probiotics in reducing antimicrobial use (AMU) and improving production in dairy.	<a href="#">Report on surveillance in commercial poultry</a>
			2019 extended to 2021 - Risk map completed on insecticide resistance selection across rice farming areas in three countries in West Africa.	Changed	This milestone was changed from its original focus on insecticide risk mapping in 3 west African countries to implementation of insecticide resistance studies in defined locations. Data generated were therefore not suitable for developing a risk map. The Wellcome Trust funded project activities in agricultural fields where resistance of Anopheles gambiae to insecticides used was examined. A summary of this year's activities were summarized in a donor report. A password is required to access.	<a href="#">Donor report</a>
			2020 extended to 2021 - National level surveillance implemented in Kenya under the banner of the Fleming Fund	Completed	After delays in 2020 due to the global pandemic, this milestone was achieved in 2021. With the national antimicrobial resistance (AMR) task force, A4NH researchers co-developed national surveillance policies and strategies - covering field sampling, laboratory analysis, data collection, storage, analysis, and management - for mitigating the development of AMR	<a href="#">KAP survey results</a> <a href="#">Report on surveillance in</a>

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FP Outcomes	Sub-DOs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
					in animals in Kenya. More specifically, A4NH researchers supported the implementation of surveillance activities in poultry and dairy production systems in two provinces, screening for AMR in four bacterial species, Salmonella, Campylobacter, E.coli and Enterococci. In addition, AMR surveillance capacity was increased through enhanced veterinary laboratory capacity at six labs that serve 15 counties. To date, the AMR surveillance protocols have been established and approved by the Directorate of Veterinary Services for use in those two provinces and were submitted to the National AMR Task Force for approval and nationwide adoption. This work was part of an investment from the Fleming Fund country grant to Kenya, the CGIAR AMR Hub, as well as A4NH. The evidence links point to published research that contributed to this milestone; a link to the protocols could not be provided because they have not yet been approved by the government.	<a href="#">commercial poultry</a>
			2020 extended to 2021 - Antimicrobial susceptibility testing facilities up and running in CGIAR AMR Hub lab in support of internal and external partners for diagnostic purposes and capacity development	Completed	In 2019, the CGIAR Antimicrobial Resistance (AMR) Hub agreed to establish an antimicrobial susceptibility testing (AST) Centre of Excellence at ILRI in collaboration with the European Committee on Antimicrobial Susceptibility Testing and the International Centre for Antimicrobial Resistance Solutions (ICARS). Memoranda of understanding were signed by both organizations in 2021 and Jimmy Smith, ILRI Director General, was appointed to the ICARS Board of Directors in November 2021. By 2021, the laboratory had purchased and installed a wide range of equipment including a MALDI-TOF MS, an instrument that can rapidly identify bacterial species within seconds, and the Sensititre MIC testing system, which can reveal whether a bacterial isolate is susceptible to a particular drug, how susceptible it is, and the exact point at which it becomes resistant. The MALDI-TOF MS is one of only six instruments currently available in Kenya and the Sensititre was the first system in the Kenya at the time. A4NH researchers have also developed standardized operational protocols for laboratory testing. By design, the lab facilities and resources are being used by local and international researchers, in onsite training. Evidence links point to resources from ICARS referencing the partnership and examples of the type of research being conducted.	<a href="#">ICARS Annual Report</a> <a href="#">ICARS Appointment Review</a> <a href="#">CGIAR AMR Hub research applications</a>
FP5 Outcome: Agricultural research and funding institutions initiate collaboration with public health counterparts to	<ul style="list-style-type: none"> <li>Increased safe use of inputs</li> <li>Enhanced institutional capacity of partner research organizations</li> </ul>	One of the primary mechanisms used by A4NH to support collaboration between agricultural and public health research and their funders has been the Agriculture, Nutrition, and Health Academy (ANH)	2021 - Collaborations between public health and agriculture stakeholders established earlier in this program are used to investigate multidimensional impacts of	Changed	A4NH researchers incorporated screening for COVID-19 exposure into selected sero-epidemiological studies to obtain more insights on the epidemiology of the disease. All the collaborations took place in one country, Kenya, not two or more countries, which is why we report this milestone as changed. For example, a study in Kenya on Rift Valley fever in humans and animals amended a study to include SARS-CoV-2 screening in samples collected from pastoralists and slaughterhouse workers in northern	<a href="#">GISAID's COVID-19 Database</a>



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FP Outcomes	Sub-DOs	Summary narrative on progress against each outcome this year	Milestone	2021 milestone status	Brief Explanation	Link to evidence
solve complex intersectoral problems	<ul style="list-style-type: none"> <li>Enhanced individual capacity in partner research organizations through training and exchange</li> </ul>	<p>Academy). Although the week-long ANH Academy conference was forced to move online again in 2021, its participation continued to grow, drawing almost 1000 participants in 2021. The Academy itself now has over 4000 members from a wide range of disciplines.</p>	COVID-19 in at least two countries in SSA/SEA		Kenya. At the time of this report, the samples were being screened; results will be published in 2022 after A4NH ends. Meanwhile, A4NH data has been submitted to GISAIID's COVID-19 Database ( <a href="#">link to evidence</a> ). In another example, A4NH researchers designed a sewage surveillance study in Nairobi to explore opportunities of using this approach to map risk. This approach could become an important tool as COVID-19 becomes endemic, or subclinical, in vaccinated populations. Wastewater samples could also be screened for other pathogens, including antimicrobial resistant (AMR) bacteria. Lastly, the One Health Research, Education and Outreach Centre (OHRECA) supported two other activities on COVID B cell profiling in COVID-19 patients in Kenya to explore possibilities of generating sera that can be used for passive treatment.	
			2021 - At least one thousand researchers representing natural and social scientists from health and agriculture participate in theme-based learning labs and conferences in 2021 to identify and develop research areas and skills, recognizing gender and equity issues	Completed	With members in over 100 countries, the Agriculture, Nutrition, and Health Academy (ANH Academy) has become a global network and platform for sharing research and evidence, capacity strengthening and collaboration across diverse disciplines. The annual ANH Academy Week enables Academy members to meet for learning labs and an interdisciplinary research conference. The 2021 Academy Week was held online again due to the global pandemic. A4NH is a co-sponsor of the event and A4NH researchers delivered numerous learning labs and scientific presentations. In terms of learning labs, ones related to the A4NH portfolio included "Conducting randomized controlled trials of complex interventions in agriculture, nutrition, and health"; "Application of a common approach to measure the costs and benefits of your agriculture, nutrition, health program, project or intervention"; "Measuring empowerment in nutrition-sensitive agricultural development projects using pro-WEAI"; and "Food systems and food choice concepts and strategies for promotion of sustainable healthy diets in low- and middle-income countries."	<a href="#">ANH Academy Report</a> <a href="#">Learning Lab on RCTs</a> <a href="#">Learning Lab on costs and benefits</a> <a href="#">Learning Lab on Pro-WEAI</a> <a href="#">Learning Lab on food systems</a>

**Table 6: Number of peer-reviewed publications from 2021 (sphere of control)**

	Number	Percent
Peer-reviewed publications	245	100.0%
Open Access	221	90.2%
ISI	229	93.47%

**Table 7: Number of participants in capacity development activities in 2021 (sphere of control)**

Number of trainees	Female	Male
In short-term programs facilitated by CRP/PTF	158,647	207,259
In long-term programs facilitated by CRP/PTF	47	54
PhDs	17	29

Evidence Link: <https://cgiar.sharepoint.com/:x/s/IFPRI/A4NH/EfxusIH7pqhEu6f8dIT-5RsB57JLq-7q2BPllcu5qtYBGQ?e=PUMjvZ>

**Table 8: Key external partnerships***Presented chronologically by flagship.*

Lead FP	Brief description of partnership aims	List of key partners in partnership.	Main area of partnership
FP1	To implement a multi-country project designed to increase vegetable intake, reduce malnutrition, improve income and productivity of smallscale vegetable producers, and expand sustainable land use for vegetable production.	<ul style="list-style-type: none"> <li>• AVRDC - The World Vegetable Center</li> <li>• INERA - Institut de l'Environnement et de Recherches Agricoles (Burkina Faso)</li> <li>• CIRAD - Centre de coopération internationale en recherche agronomique pour le développement</li> <li>• IER - Institut d'Economie Rurale (Mali)</li> <li>• INRAB - Institut National de Recherche Agricole du Benin</li> </ul>	<ul style="list-style-type: none"> <li>• Research</li> </ul>
FP1	To contribute to multi-level state dialogues, contextualize the Action Tracks, and find meaningful synergies and new actions for Viet Nam as part of the United Nations Food System Summit (UNFSS).	<ul style="list-style-type: none"> <li>• NIN - National Institute of Nutrition, Vietnam</li> <li>• MARD - Ministry of Agriculture and Rural Development (Vietnam)</li> <li>• VAAS - Vietnam Academy of Agricultural Sciences</li> <li>• FAO - Food and Agriculture Organization of the United Nations</li> <li>• Government of Canada</li> </ul>	<ul style="list-style-type: none"> <li>• Policy</li> <li>• Research</li> </ul>
FP1	To develop and implement a massive open online course (MOOC) on food systems for healthier diets.	<ul style="list-style-type: none"> <li>• INRAE - French National Research Institute for Agriculture, Food and Environment</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity Development</li> </ul>
FP1	To contextualize the Ethiopian national food based dietary guidelines (FBDGs) for pastoralist settings through adaptation of the same process that was used to develop the national FBDGs.	<ul style="list-style-type: none"> <li>• EPHI - Ethiopian Public Health Institute</li> <li>• HU - Haramaya University</li> </ul>	<ul style="list-style-type: none"> <li>• Research</li> </ul>
FP2	To promote biofortification through radio programs and help scale biofortification in West Africa, particularly the Sahel region.	<ul style="list-style-type: none"> <li>• FRI - Farm Radio International</li> </ul>	<ul style="list-style-type: none"> <li>• Delivery</li> </ul>
FP2	To conduct experiments to understand the type of mechanisms (e.g. contracting - formal and informal) for movement of biofortified crops along the value chain.	<ul style="list-style-type: none"> <li>• J-PAL - Abdul Latif Jameel Poverty Action Lab</li> <li>• University of Zurich</li> </ul>	<ul style="list-style-type: none"> <li>• Research</li> </ul>
FP2	To conduct implementation research and monitoring on commercialization of biofortified crops and foods in India with implications/lessons learned for other countries.	<ul style="list-style-type: none"> <li>• IPE Global</li> </ul>	<ul style="list-style-type: none"> <li>• Delivery</li> </ul>
FP2	To jointly facilitate policy engagement for scaling biofortification in three countries – Nigeria, Malawi and Uganda. Activities included workshops on policy landscape studies, seed systems and traceability, and national platforms.	<ul style="list-style-type: none"> <li>• AGRA - Alliance for a Green Revolution in Africa</li> </ul>	<ul style="list-style-type: none"> <li>• Policy</li> </ul>
FP3	To conduct food safety research and impact assessments and co-supervise PhD students.	<ul style="list-style-type: none"> <li>• NRI - Natural Resources Institute, University of Greenwich</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity Development</li> <li>• Research</li> </ul>

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Lead FP	Brief description of partnership aims	List of key partners in partnership.	Main area of partnership
FP3	To co-develop a discussion paper for United Nations Nutrition (UN Nutrition) on livestock-derived foods and sustainable healthy diets and disseminate findings.	<ul style="list-style-type: none"> <li>• IFAD - International Fund for Agricultural Development</li> <li>• UN Nutrition</li> <li>• WUSTL - Washington University in St. Louis</li> <li>• WFP - World Food Programme</li> <li>• WHO - World Health Organization</li> <li>• FAO - Food and Agriculture Organization of the United Nations</li> </ul>	<ul style="list-style-type: none"> <li>• Policy</li> <li>• Research</li> </ul>
FP3	To collaborate on risk assessment of urban agriculture for heavy metal contamination and informally processed foods in peri-urban Kenya.	<ul style="list-style-type: none"> <li>• UoN - University of Nairobi</li> </ul>	<ul style="list-style-type: none"> <li>• Research</li> </ul>
FP3	To expand manufacturing and distribution of Aflasafe in Mozambique, as part of aflatoxin management strategies centered on biocontrol.	<ul style="list-style-type: none"> <li>• AflaLivre Moçambique S.A.</li> <li>• MIRUKU COOP</li> <li>• AMPCM - The Mozambican Association for the Promotion of Modern Cooperativism / Associação Moçambicana Para Promoção do Cooperativismo Moderno</li> <li>• Norges Vel - Royal Norwegian Society for Development</li> </ul>	<ul style="list-style-type: none"> <li>• Delivery</li> </ul>
FP3	To promote a process which maximizes private sector production of Aflasafe products for commercial use in Senegal, Tanzania, and Nigeria benefiting 12 countries across the African continent.	<ul style="list-style-type: none"> <li>• Harvestfield Industries Limited</li> <li>• SAPHYTO - Société Africaine de Produits Phytosanitaires et d'Insecticides</li> <li>• UPL - UPL Limited</li> <li>• IER - Institut d'Economie Rurale (Mali)</li> <li>• ITRA - Institut Togolais des Recherches Agronomiques</li> <li>• FAO - Food and Agriculture Organization of the United Nations</li> <li>• AISL - Agro-Input Suppliers Limited</li> <li>• Samil Industrial Ltd.</li> <li>• AflaLivre Moçambique S.A.</li> <li>• A to Z Textile Mills Ltd.</li> <li>• BAMTAARE SA</li> </ul>	<ul style="list-style-type: none"> <li>• Delivery</li> </ul>
FP4	To finalize, disseminate, and operationalize the Committee on World Food Security's (CFS) new Voluntary Guidelines for Food Systems and Nutrition.	<ul style="list-style-type: none"> <li>• FAO - Food and Agriculture Organization of the United Nations</li> </ul>	<ul style="list-style-type: none"> <li>• Policy</li> <li>• Delivery</li> </ul>
FP4	To generate evidence on integrated approaches for the prevention and treatment of child wasting in three West African countries, which contributes directly to a series of strategies for tackling undernutrition.	<ul style="list-style-type: none"> <li>• UNICEF - United Nations Children's Fund</li> </ul>	<ul style="list-style-type: none"> <li>• Policy</li> <li>• Research</li> </ul>
FP4	To strengthen food systems approaches to programming at the World Food Program (WFP) and support its leadership in the United Nations Food Systems Summit (UNFSS).	<ul style="list-style-type: none"> <li>• WFP - World Food Programme</li> </ul>	<ul style="list-style-type: none"> <li>• Delivery</li> </ul>

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Lead FP	Brief description of partnership aims	List of key partners in partnership.	Main area of partnership
FP5	To provide written research and advisory support on the development of manuscripts on antimicrobial resistance (AMR), specifically AMR in India (Royal Veterinary College only) and AMR in crops (all partners).	<ul style="list-style-type: none"> <li>• RVC - Royal Veterinary College</li> <li>• CABI - Centre for Agriculture and Biosciences International</li> <li>• UCPH - University of Copenhagen</li> </ul>	• Research
FP5	To estimate the prevalence of antimicrobial resistance (AMR) in non-typhoidal Salmonella from pork sold in boutique supermarkets in Viet Nam and perform antibiotic sensitivity testing.	<ul style="list-style-type: none"> <li>• NIVR - National Institute of Veterinary Research (Vietnam)</li> </ul>	• Research
FP5	To develop deep-learning algorithms to support the analysis of high-resolution Earth Observation (EO) data for vector-borne disease control in agricultural landscapes.	<ul style="list-style-type: none"> <li>• UPCH - Universidad Peruana Cayetano Heredia</li> </ul>	• Research
FP5	To conduct morphological and molecular species identification on mosquitoes collected from trials after each rice season, in order to determine the mosquito species composition in rice fields in Ivory Coast.	<ul style="list-style-type: none"> <li>• IRP - Institut Pierre Richet</li> </ul>	• Research
FP5	To develop One Health research and capacity building initiatives and strengthen networks in sub-Saharan Africa as part of the One Health Centre in Africa, led by and based at ILRI.	<ul style="list-style-type: none"> <li>• AU-IBAR - African Union - Interafrican Bureau for Animal Resources</li> <li>• IGAD - Intergovernmental Authority on Development</li> <li>• VSF-Germany - Vétérinaires sans Frontières - Germany</li> <li>• Freie Universität Berlin</li> <li>• BfR - Bundesinstitut für Risikobewertung</li> <li>• FLI - Friedrich-Loeffler-Institut</li> <li>• Afrique-One-ASPIRE</li> <li>• OIE - World Organisation for Animal Health</li> <li>• FAO - Food and Agriculture Organization of the United Nations</li> <li>• WHO - World Health Organization</li> </ul>	<ul style="list-style-type: none"> <li>• Capacity Development</li> <li>• Research</li> </ul>

**Table 9: Internal Cross-CGIAR Collaborations***Presented chronologically by flagship.*

Brief description of the collaboration	Name(s) of collaborating CRP(s), Platform(s) or Center(s)	Optional: Value added, in a few words
To undertake joint research on scenario-guided planning in Bangladesh, which is used to target and implement policy interventions for improving food and nutrition security under a changing climate. Modeling tools, databases and dashboards are improved to reveal trade-off and synergy on carbon emissions and healthy diet outcomes in development paths at subnational level. In addition, two external stakeholder audiences oriented towards climate action are engaged in the development of storylines and priority setting: Zero Hunger Zero Emission, a civil society driven network on climate action, and the Bangladesh Delta Plan, convened by the Planning Commission and Deltares to develop a long-term plan for the Delta region.	CCAFS	Broadened participatory stakeholder planning on climate action to incorporate diet outcomes; strengthened research alliances on metrics, models and data; and efficiency in implementation
To contribute to multi-level state dialogues, contextualize the Action Tracks, and find meaningful synergies and new actions for Viet Nam as part of the United Nations Food System Summit (UNFSS). The primary Action Tracks were: (1) access to safe and nutritious food for all; (2) sustainable consumption patterns; (3) sustainable food production; (4) competitive, inclusive, and equitable food value chains; and (5) resilience to vulnerabilities, shocks, and stress. This cross-CGIAR partnership was facilitated mainly by FP1, with support from FP3.	CCAFS, CIFOR, CIP, ICRAF, IRRI, RTB, WorldFish	Leveraged experience and expertise
To conduct new research in two areas: an evaluation of vegetatively propagated biofortified seed systems and an ex-ante analysis and cost per disability adjusted life years (DALYs) saved for orange sweet potato (OSP) programs using a HarvestPlus model, as part of PIM's Seed Systems and Markets Project.	PIM, CIP	Leveraged experience and expertise; amplified messages, outputs, outcomes and the potential impact of biofortification
To co-create, consolidate and share cutting-edge methods and tools that can help CGIAR, national agricultural research extension systems, universities and non-governmental organizations (NGOs) achieve gender equality outcomes. Its two goals are to enable critical discussion, reflection, development and dissemination of gender research methods as well as to strengthen and facilitate the use of methods, tools and standards for integrating gender research across CGIAR.	Gender	Capacity strengthening; leveraged experience and expertise; amplified messages, outputs, outcomes and potential impacts related to gender equality
To conduct field work, including morphological and molecular species identification on mosquitoes collected from trials after each rice season in West Africa.	AfricaRice	Research, leveraged experience and expertise, outputs, outcomes on scientific evidence and benefits

**Table 10: Monitoring, Evaluation, Learning and Impact Assessment (MELIA)**

Presented chronologically by flagship. For readability, URLs have been embedded as hyperlinks in this table. The information was entered as required in MARLO. For links that lead the reader to password-protected sites, please email [a.wyatt@cgiar.org](mailto:a.wyatt@cgiar.org) for access. Some studies that appeared in Table 2B in the 2021 POWB were removed from this table based on new reporting guidance and feedback we received suggesting what we had included were not relevant.

Studies/learning exercises planned for this year	Status	Type of study or activity	Description of activity / study	Links to MELIA publications
<b>S3715 - Evaluation on where are the opportunities for accelerating food system innovations</b>	Completed	Synthesis (secondary) study	Building on research from the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH) flagship on Food Systems for Healthier Diets, the study looked at how evidence from past studies of the impacts of food systems innovations on diet-related outcomes maps to current food system priorities in Viet Nam, one of the program's focus countries. It then explored what the studies can tell us about the impact pathways from innovations to healthier diets and other outcomes. The findings highlight some promising innovations that have potential for further research and scaling. A revised impact pathway is also proposed based on a new understanding of how the concept of the food environment can be integrated into an impact pathway framework. The new impact pathway and associated assumptions—taken together, the theory of change—can support better understanding and analysis of the impacts of food system innovations on diets.	<a href="#">Study report</a>
<b>S3717 - Review on working with the private sector for food system transformation</b>	Completed	Synthesis (secondary) study	This study analyzed 88 identified studies to highlight the role of the private sector in food system transformation processes and its contribution to food and nutrition security in developing countries. Only a few private sector studies seriously addressed trade-offs for food systems change. Much attention was given to opportunities for better bilateral linkages with supplier or consumer segments of the supply chain. Reaching improved food system outcomes was pursued through three different channels: (i) providing leadership to innovation processes, (ii) learning and relationship management between key food system stakeholders, and (iii) creating policy conditions for food systems change. Depending on the barriers or catalysts for influencing food systems outcomes, the authors discussed several potential strategies for increasing societal impact of private food sector activities. The study was completed as an internal report, the link requires a password to access. It may be disseminated more widely after A4NH ends.	<a href="#">Internal report</a>
<b>S3716 - Review of food system innovations for fruits and vegetables</b>	Completed	Synthesis (secondary) study	This scoping study focused on the consumption and production of fruits and vegetables as part of the food system in low- and middle-income countries, and in particular in seven countries. The researchers first mapped trends in global and regional food systems, with a focus on South Asia and East and West Africa. In the country study, the researchers zoomed in on Bangladesh, Ethiopia, Nepal, Nigeria, Tanzania, India and Burkina Faso. The motivation was to investigate the potential of vegetable and fruit supply chains to increase the supply of and strengthen demand for nutritious foods, as well as increase local market opportunities for increased income, especially for women. The study combined literature review and data analysis to identify several issues and knowledge gaps that need further in-depth research.	<a href="#">Study report</a>
<b>S3719 - Cross-country learning exercise of the food systems for healthier</b>	Completed	Synthesis (secondary) study	The aim of this study was to draw key lessons and provide important insights on how a research program could be organized to contribute to transforming food systems for healthier and sustainable diets. Based on key learning questions jointly formulated around purpose, value and principles with flagship partners, information was collected	



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Studies/learning exercises planned for this year	Status	Type of study or activity	Description of activity / study	Links to MELIA publications
diet approach in four focus countries			through a document review, interviews with the program team and country coordinators, an online survey with national participants, a workshop with flagship related PhDs, and program level and national level reflection sessions. The study was completed and an internal report prepared, which is why we have not provided a link.	
<b>S3718 - Case studies on how a food systems approach can be operationalized for national food system transformation</b>	Completed	Synthesis (secondary) study	This synthesis study looked at how national food system transformation was operationalised in four countries, using the multilevel perspective theory of Geels et al. The contribution of key FP1 (and A4NH) activities and results carried out in four countries were reviewed on whether and in what way they contributed to these three pathways from Geels et al. Entry points and pathways supported differed by country. Ethiopia and Viet Nam, focused on downstream activities based on the high and active involvement of government. In Bangladesh, the focus was on coalition building through multi-stakeholder platforms like the SUN Business Platform. In Nigeria, it was a combination of sub-national downstream activities and contribution to diversity through experiments and pilots especially in the area of fruits and vegetables. The study was completed as an internal report, which is why we have not provided a link. It may be disseminated more widely after A4NH ends.	
<b>S3049 - Case study on lessons learned on the delivery of biofortified crops in India, Nigeria, and Uganda</b>	Completed	Qualitative Outcome Study	The multi-country review highlighted lessons learned from multiple large-scale delivery strategies used by HarvestPlus to scale up biofortification across different country and crop contexts. In summary, the impact of biofortification ultimately depends on the development of sustainable markets for biofortified seeds and products. Results illustrate the need for context-specific, innovative solutions to promote widespread adoption.	<a href="#">Multi-country review</a>
<b>S3051 - Validation of the new theory of change for commercialization of biofortification, including a set of a harmonized indicators</b>	Completed	Other MELIA activity	HarvestPlus and the CIP orange sweet potato (OSP) program developed a uniform/harmonized MELIA system for biofortification – to form the basis of MELIA to be conducted for all the future investments in biofortification. Work included developing the definitions of the indicators and tools, testing the harmonized theory of change (ToC) with stakeholders, and testing the feasibility, use and usefulness of indicators. By the end of 2021, the new TOC and indicators were in use as part of a bilaterally-funded Commercialization of Biofortified Crops program in India, Nigeria, Bangladesh, Pakistan, Tanzania, Kenya. As part of ongoing M&E in that program, the indicators will be tested and further refined. HarvestPlus and CIP's own internal M&E databases have been revised based on the new indicators. All supporting documentation is internal. A link to the most recent version of the indicator definition tables has been provided (password required to access).	<a href="#">Internal resources</a>
<b>S3726 - Biofortification program handover sustainability assessment in Rwanda</b>	Completed	Program/project adoption or impact assessment	A rapid assessment of the post-handover continuity, and challenges of iron bean production in Rwanda was conducted by HarvestPlus in 2020 and results presented internally in 2021. The aim was to assess the functional status of the systems (and sustainability pillars) established by HarvestPlus and partners before the handover, and the challenges faced by value chain actors (VCAs), along the iron bean value chain in Rwanda. Results showed that the established iron bean value chain actor pillars are largely functional one-year post-handover of the HarvestPlus program, the breeding pipeline is active, and there is an unmet demand for high iron beans, certified seed and grain. Password is required to access the internal report. A link to a publicly available blog post referencing key findings from the study is provided, as well.	<a href="#">Internal report</a> <a href="#">Blog post referencing key findings</a>

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Studies/learning exercises planned for this year	Status	Type of study or activity	Description of activity / study	Links to MELIA publications
<b>S3728 - Influence of CGIAR investment in NARS and how future partnerships can be designed to accelerate breeding, testing and release of biofortified crops</b>	Completed	Program/project evaluation/review	The review focuses on HarvestPlus' second and third phases in which biofortification breeding programs were established in several countries. The scope of the study covered zinc rice in Bangladesh, iron beans in Rwanda and iron pearl millet in India and was guided by three questions: EQ 1: How and to what extent did HarvestPlus contribute to the establishment and implementation of sustainable biofortification breeding programs in Bangladesh, India and Rwanda? EQ 2: How and to what extent can the respective biofortification breeding programs be scaled and made more sustainable? EQ 3: What are the implications of this evaluative review for how CGIAR researchers work with NARES on breeding programs for biofortified crops?	<a href="#">Evaluation report</a>
<b>S3042 - Monitoring survey for vitamin A maize in Malawi</b>	Completed	Program/project adoption or impact assessment	Surveys inform country-level programming on: farmers' (i) feedback on agronomic properties of biofortified crops and (ii) intention to grow biofortified crops in the following season and area they will allocate; (iii) what proportion of output is consumed at home vs sold vs shared as food; (iv) if homegrown biofortified crop is being consumed by most vulnerable household members, and (v) if household also consumes market-purchased biofortified food to assess market development. Results are used as parameters in the Global Households Reached Projection Model which estimates the number of biofortified crop growing (and hence consuming) households in a given year. Data were analyzed, but not prepared for a formal report.	
<b>S3047 - Monitoring survey for vitamin A maize in the Democratic Republic of Congo (DRC)</b>	Completed	Program/project adoption or impact assessment	Surveys inform country-level programming on: farmers' (i) feedback on agronomic properties of biofortified crops and (ii) intention to grow biofortified crops in the following season and area they will allocate; (iii) what proportion of output is consumed at home vs sold vs shared as food; (iv) if homegrown biofortified crop is being consumed by most vulnerable household members, and (v) if household also consumes market-purchased biofortified food to assess market development. Results are used as parameters in the Global Households Reached Projection Model which estimates the number of biofortified crop growing (and hence consuming) households in a given year. Data from two surveys which included vitamin A maize were analyzed, but not prepared for a formal report.	
<b>S3050 - Updated ex ante impact and cost effectiveness analyses of all target crop-country combos</b>	Partially Complete	Ex-ante, baseline and/or foresight study	This large piece of work could not be completed before A4NH ended. For A4NH's work on biofortification, led by HarvestPlus, a high percentage (90%) of resources came from bilateral funding. CRP funding has been able to leverage this for evaluation. Given greater than expected reductions in bilateral funding for biofortification during Phase II, the scope of the work that this evaluation was able to inform was more limited than previously planned, but useful for an important subset of the evidence on zinc. An ex-ante analyses was published (2010) plus an updated paper on the ex ante models (2018). The idea was to update this analyses, comparing it to other interventions addressing micronutrient malnutrition to assess whether the approach still makes sense. The updated analyses was to rely on new data on biofortification, including cost, adoption, variety performance, and externally generated, data on micronutrient malnutrition in relation to burden of disease.	
<b>S3727 - Ex ante impact and cost effectiveness analyses of orange sweet potato</b>	Partially Complete	Ex-ante, baseline and/or foresight study	Orange sweet potato was included as part of a larger piece of work to update ex-ante impact and cost-effectiveness analyses of all target crop-country combos. The work remains ongoing, but due to lack of staff time, a working paper could not be finalized before the end of the year when A4NH ends. It will be finalized and submitted for publication in 2022.	

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Studies/learning exercises planned for this year	Status	Type of study or activity	Description of activity / study	Links to MELIA publications
<b>S3734 - Review on wet markets for fresh foods: health, equity and economic risks and benefits and options for future</b>	Completed	Synthesis (secondary) study	Live and wet markets serve as hubs where humans and different animal species are in close proximity, but they are also crucial for food supply in many countries. The authors bring data together on the global impact of live and wet markets on the emergence of zoonotic diseases. They discuss how benefits can be maximized and risks minimized and conclude that current regulations should be implemented or revised, to mitigate the risk of new diseases emerging in the future.	<a href="#">Opinion piece</a>
<b>S651 - Ex ante impact assessment on policy and informal milk sector in Kenya, Tanzania, and India (Assam)</b>	Partially Complete	Ex-ante, baseline and/or foresight study	During Phase II of A4NH, researchers from ILRI and the International Institute for Environment and Development (IIED) have been studying what the alternatives are to formalizing informal dairy markets. More specifically, they are assessing how policy innovations linked to ILRI's light-touch approach to formalization (or the "three-legged stool approach") that has been or is being trialed in Kenya, Tanzania, and India (Assam) worked, and why they struggled to continue beyond a pilot phase in some countries. In 2020, the first step, a literature review, was completed. The full report is expected was expected to be published in 2021 but there has been a delay and will be completed after A4NH ends, along with the full synthesis report.	
<b>S3736 - Evaluation on how A4NH gender and empowerment frameworks and tools have influenced development program implementers and donors</b>	Completed	Program/project evaluation/review	Two key outputs of the Gender, Agriculture, and Assets Project, Phase 2 (GAAP2) are the project-level Women's Empowerment in Agriculture Index (pro-WEAI) and the Reach, Benefit, Empower (RBE) framework. An e-survey was used to get a sense of awareness and use of pro-WEAI and the RBE framework among a target population of potential users (A4NH program stakeholders). More than 30 semi-structured interviews were conducted with funders, implementers, and evaluators, mainly but not exclusively associated with GAAP2, to understand how tools were used at different stages of the program/project cycle, from influencing program objectives and outcomes to program/project design to impact evaluation. The evaluation found that even though the pro-WEAI and the RBE framework are relatively new and their use is not yet widespread, their use in projects is growing and they have contributed to changes in project priorities and in how projects seeking to empower women are designed and evaluated.	<a href="#">Evaluation report</a>
<b>S3735 - Evaluation of effects of A4NH capacity building efforts on nutrition leadership capacity in Africa</b>	Completed	Program/project evaluation/review	A new part of the second phase of A4NH had an intentional focus on nutrition leadership, which built on evidence and experience from key partners like the African Nutrition Leadership Program, the Institute of Development Studies, and A4NH's own bilateral projects. Due to limited resources and capacity, the scope of the study changed. Rather than an evaluation, A4NH developed a theory of change to reflect on how it supported nutrition leadership development. Using program documents, peer-reviewed and grey literature, and interviews, a short internal report describes an initial theory of change. It could be used by CGIAR, or its partners, as a starting point for future evaluations and/or to refine future data collection, analysis, or reporting of nutrition leadership development activities.	<a href="#">Internal report</a>
<b>S3737 - Case studies on uptake and use of A4NH nutrition-sensitive agricultural guidance by</b>	Completed	Program/project evaluation/review	In 2021, A4NH commissioned an external study to document and analyze two researcher-implementer partnerships between IFPRI and Helen Keller International (HKI) and the World Food Programme (WFP), including their history, formation, outputs, and outcomes, to raise awareness about and improve understanding of high-quality researcher-implementer partnerships. The study was carried out through four case studies. Case 1 focused on the long-term partnership between IFPRI and HKI. Case 2 looked at evidence generated by the partnership on the	

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Studies/learning exercises planned for this year	Status	Type of study or activity	Description of activity / study	Links to MELIA publications
development program implementers			effectiveness of homestead food production programs on nutrition-related outcomes and its use by funders and implementers. Case 3 looked at how and to what extent approaches developed by the partnership for the design, implementation, and evaluation of programs — specifically the program impact pathway (PIP) approach — have influenced the broader field of program evaluation. Case 4 examined a newer, ongoing partnership between IFPRI and WFP. Publications will be online in April 2022.	
<b>S3056 - Ex-ante assessment of the potential outcomes of antimicrobial resistance (AMR) research and development activities implemented through the CGIAR AMR Hub</b>	Completed	Ex-ante, baseline and/or foresight study	An ex-ante assessment of the potential outcomes of antimicrobial resistance (AMR) research and development activities implemented through the CGIAR AMR Hub. The report was finalized as an internal report. Wider dissemination may be planned for after A4NH has ended. Password is required to access the internal report.	<a href="#">Internal report</a>
S3739 - Review on bushmeat trade and consumption and the risk of zoonotic diseases and contribution to antimicrobial resistance	Completed	Synthesis (secondary) study	Based on a literature review, the final report seeks to understand wild meat value chains – comprising hunting, marketing, consumption and management of wild meat – and related policies and their implications for zoonotic risks to people. The report synthesizes the assembled evidence to generate recommended research priorities to further mitigate zoonotic risks related to wild meat. The review has been completed and submitted for formatting by ILRI and it will then be catalogued in their CGSpace. In the meantime, a link to the submitted report has been provided (password required to access).	<a href="#">Unformatted report</a>
S3740 - Ex-ante assessment on how agricultural activities affect public health in low- and middle-income countries	Completed	Ex-ante, baseline and/or foresight study	A systematic review by A4NH researchers confirmed that in Africa, irrigated rice is associated with more malaria in local residents. Field studies from Côte d'Ivoire suggest that integrated methods, including alternate wetting and drying (AWD) irrigation, can suppress the production of both mosquitoes and greenhouse gases in irrigated rice fields, while not compromising yield. The synoptic review and meta-data analysis is currently online with 'Preprints with The Lancet' (part of the Social Science Research Network's First Look).	<a href="#">Pre-print in The Lancet</a>
<b>S3738 - Review on emerging zoonoses, including understanding risks and linking to systems change</b>	Partially Complete	Synthesis (secondary) study	Using semi-arid regions of Africa as a case study, the authors review current approaches and provide a practical approach by which surveillance can be strengthened and integrated into existing systems. The review was completed and submitted to a journal for publication, but was rejected. The authors are revising and intend to resubmit, but this will be done after A4NH ends.	

**Table 12: Examples of W1/W2 use in 2021***Presented by broad area of use.*

<b>Specific examples, one per row (including through set aside strategic research funds or partner funds)</b>	<b>Broad area of use of W1/W2</b>
Portfolio of studies in food systems innovations, including synthesis work, fruits and vegetables, and private sector partnerships.	Research
Synthesis of frameworks and tools for measuring women's empowerment in agriculture and ongoing support to the development and dissemination of the project-level Women's Empowerment in Agriculture Index (pro-WEAI) with partners.	Research
Cross-country assessments of food systems transformation processes in the four focus countries with a synthesis report and a mixed methods "learning journey" engagement with national partners.	Research
Implementation of a portfolio of research projects in the CGIAR Antimicrobial Resistance (AMR) Hub to support country solutions for mitigating AMR in Kenya, Viet Nam, Bangladesh and Uganda, plus a synthesis report of AMR lessons over 3-years of research, policy support and capacity development.	Research
Pivot of multiple A4NH research areas to address the COVID-19 pandemic including on One Health, nutrition and food systems transformation. A4NH played a coordinating role for CGIAR COVID-19 responses (including co-leading the CGIAR COVID-19 Hub) and for IFPRI (including blogs, events, books and reports).	Research
Support to in-country coordination teams and national partners in the five focus countries linking A4NH research to national government and partner priorities and actions. Additional support in 2021 for involvement in the national dialogues as part of the United Nations Food Systems Summit (UNFSS), especially in Ethiopia and Viet Nam.	Policy
Synthesis of policy narratives to support agriculture-nutrition programs and policies through Stories of Change and Stories of Challenge with multiple outputs and dissemination events, with targeted contributions to national programs in India, Malawi, Ethiopia and multiple West African countries.	Policy
Commercialization, regulation and delivery channel actions at different stages of delivery to guide investment, partnerships, and enabling action for scaling up Aflasafe in Africa	Delivery
Development and delivery of a mini-Massive Open Online Course (mini-MOOC) on food environments for healthy and sustainable diets.	Capacity development
Co-sponsor of the Agriculture, Nutrition, and Health Academy week conference (virtual with more than 900 participants); funded food systems PhD programs and seed grants to local MSc students; support to the Scaling up Nutrition (SUN) movement, the Comprehensive Africa Agriculture Development Programme (CAADP), and other nutrition leadership capacity development efforts.	Capacity development
Portfolio of healthy food systems research projects developed with CGIAR and French partners. Topics include the food environment, consumer behavior, dietary diversity and development of new methods and tools.	Partnerships
Monitoring evaluation and learning studies including methods and tools for prioritization and a study on national partnerships for biofortification breeding programs.	Other monitoring, evaluation, learning, and impact assessment (MELIA)
Support to activities providing evidence inputs to the Africa Union (AU) including the Africa Food Safety Index (AFSI) with the Partnership for Aflatoxin Control in Africa (PACA), CAADP indicators for nutrition, AU contribution to United Nations population and health processes and Africa Day for Food and Nutrition Security	Other: dissemination
Development and dissemination of food systems tools, methods and ideas through the Food System Resource Center (FSRC) and Food Systems Idea Exchange (FSIE). Maintenance and promotion of the Gender Nutrition Idea Exchange (GNIE) and contribution of nutrition and gender methods and tools to the CGIAR collaborative platform for gender research.	Other: dissemination and synthesis

**Table 13: CRP Financial Report**

	2020 forecast (W1/W2)	2021 budget (W1/W2)	Comments on major changes
Personnel	9,308,659	8,462,417	
Consultancy	1,181,584	1,074,167	
Travel	458,733	417,030	
Operational expenses	8,668,077	8,168,076	
Collaborators and partnerships	3,466,110	2,544,378	
Capital and equipment	-		
Closeout cost	60,000	60,000	
CRP Total Budget	<b>\$23,143,162.90</b>	<b>\$20,726,069.23</b>	
CGIAR COVID-19 Hub Initiative	\$2,544,000.00	\$2,231,982.00	
<b>GRAND TOTAL CRP BUDGET</b>	<b>\$25,687,162.90</b>	<b>\$22,958,051.23</b>	

\*Source: centers/partners PPA budget