



RESEARCH PROGRAM ON
Agriculture for
Nutrition
and Health

LED BY IFPRI

2017 ANNUAL REPORT



CGIAR RESEARCH PROGRAM ON AGRICULTURE FOR NUTRITION AND HEALTH

LED BY THE INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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1. Key Results

1.1 CRP Progress Towards Intermediate Outcomes and SLOs

With an innovative perspective that focuses on consumption and demand, the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH) seeks to realize the enormous potential of agricultural development to make significant contributions to improving the nutrition and health of people worldwide. As CGIAR's only research program on nutrition and health, A4NH focuses on the system-level outcome of improving food and nutrition security for health (Table A-1). Some of the accomplishments during the first year of our second phase include:

- Published report from an [in-depth analysis of food systems in Ethiopia](#);
- Details on the release of 29 new biofortified crop varieties, including new zinc maize, bringing the total number of farming households growing and consuming biofortified crops globally to 6.7 million households or an estimated 33 million people;
- A [special issue of *Global Food Security* dedicated to Stories of Change](#), an initiative building a resource base of experiential knowledge that explores drivers of change in improving nutrition;
- A signed memorandum of understanding with [Viet Nam's National Institute of Nutrition](#) (NIN) to strengthen collaboration in food safety research;
- Research into how rice intensification in West Africa can be achieved without increasing the risk of malaria; and
- Efforts on [incorporating equity into A4NH's research](#) agenda.

A4NH is led by the International Food Policy Research Institute (IFPRI) and managed by a group that includes four other CGIAR Centers: Bioversity International, 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).

For this annual report, we describe a selection of outcomes achieved through A4NH's five flagships and group of managing partners in 2017 (full list in Table A-2). Descriptions of other significant research outputs, events, and achievements can be found in the [interactive A4NH Annual Report 2017](#), our [website](#), or [@A4NH CGIAR](#) on Twitter.

- IITA signed a Technology Transfer and Licensing Agreement with BAMTAARE SA, a private company in sub-Saharan Africa, to manufacture and distribute Aflasafe for use in both Senegal and Gambia. The agreement establishes a plan for local manufacture, distribution, and sale, with full ownership, operation, and management by the private company and technical support from IITA. It is the first transfer license for Aflasafe to be granted to a private company in Africa. Aflasafe is being developed for several countries in sub-Saharan Africa, building on several years of collaborative research between IITA, US Department of Agriculture – Agricultural Research Service (USDA-ARS), and research and development partners.
- Policymakers in Ethiopia, informed by evidence from Transform Nutrition, redesigned the Productive Safety Net Programme to include specific nutrition elements to increase the program's potential to improve maternal and child nutrition. Women in the program now receive work credits to attend nutrition education workshops on topics including what is a balanced diet and how to prepare healthy foods. The Transform Nutrition Research Programme Consortium (2011-2017) was led by IFPRI and funded by the UK Department for International Development (DFID) with contributions from A4NH.
- Results from a randomized controlled trial (RCT) published in the *Journal of Nutrition* showed that consuming beans bred to contain higher levels of iron reduced iron deficiency and enhanced cognitive performance of iron-deficient women in Rwanda. Nutritional impact studies

of iron-biofortified crops offer a road map for policymakers to consider as they develop strategies to end hidden hunger. Iron biofortified beans were developed in through a close collaboration between HarvestPlus, CIAT, and the Rwanda Agricultural Board.

1.2 Progress by CRP Flagships

Flagship 1: Food Systems for Healthier Diets

Diagnosis and Foresight: Linking Dietary and Food System Transformations. Flagship 1 progressed with in-depth analyses of food systems in its four focus countries: Bangladesh, Ethiopia, Nigeria, and Viet Nam. The [Ethiopia participatory food system review](#) was finalized along with the research road map; the remaining reviews will be finalized in 2018 (Table A-2). Late in 2017, we initiated analysis to determine household-level dietary gaps in the four countries. This analysis comprises an assessment of food and nutrient gaps as well as dietary diversity using the most recent household expenditure survey data. In Nigeria, we started the first foresight analysis to analyze how food systems at the national level are expected to transform towards 2030 and beyond, and to identify leverage points for steering food system transformations towards closing gaps in consumer diet quality and achieving sustainable nutrition security. In 2017, the methodology was developed, comprised of a global macroeconomic model ([MAGNET](#)) with a newly developed nutrition module and the conceptualization of a microsimulation model calibrated on nationally representative expenditure household surveys. Preliminary analysis suggested synergies can be found between agricultural development and improvement in dietary quality in Nigeria, for example, through the development of domestic value chains for livestock products. In addition, the development of the [Agrobiodiversity Index](#) continued, a consistent, long-term monitoring tool showing potential key leverage points to increase agrobiodiversity in support of healthier diets. In response to knowledge and capacity gaps identified during stakeholder workshops and reviews, we developed and launched an MSc grant scheme in Ethiopia and Viet Nam. Local MSc students received a small grant to carry out food systems-related research, building capacity among young researchers and their supervisors in food systems analysis. In addition, through WUR, we started a PhD project in Ethiopia as part of the National Information Platforms for Nutrition (NIPN) in collaboration with the National Nutrition Committee, the Ethiopian Public Health Institute, and the Food and Agriculture Organization of the United Nations (FAO) to develop food-based dietary guidelines to facilitate understanding what healthy diets entail for Ethiopians.

Food System Innovations. The stakeholder workshops and participatory reviews highlighted important entry points for food system innovations in the focus countries that form the basis for future interventions. A first entry point is related to low fruit and vegetable intake, caused by low production combined with losses, waste, and low consumer demand. In 2017, we designed interventions to increase vegetable consumption in urban areas and reduce losses and waste in the vegetable value chain in Nigeria. A second entry point focuses on consumer behavior where very little is known about the drivers of consumer choices. In Nigeria, Ethiopia, and Viet Nam, we implemented consumer studies to determine entry points for interventions in the food choice environment (in Nigeria on fruit and vegetable consumption; in Ethiopia on processed foods; and in Viet Nam on wet markets and modern retail outlets).

Upscaling and Anchoring of Food System Transformation

In 2017, we carried out and submitted a manuscript reviewing the different narratives about food systems, how sustainability was defined in those narratives, and whether trade-offs between the different dimensions of sustainability were recognized. A policy baseline methodology was developed and carried out in Viet Nam to identify policy issues and key actors' perceptions on food system transformations. This methodology will be used in Bangladesh and Nigeria, where an effort

to explore the role of existing multi-stakeholder platforms for healthier diets, including network mapping and identification of key connectors, was undertaken.

Flagship 2: Biofortification

Crop Development, Mainstreaming, and Capacity Building. Collaboration between HarvestPlus, CGIAR Centers, and National Agricultural Research Systems (NARS) resulted in the release of 29 new varieties of several biofortified crops - including vitamin A maize (hybrid and open-pollinated varieties), cassava, and orange sweet potato; zinc wheat; iron pearl millet and beans; and zinc and iron lentils –across Africa, Asia and Latin America and the Caribbean in 2017 (Table D-2). As with the more than 260 biofortified varieties released over time, these not only have higher levels of micronutrients, but are also high-yielding, climate-smart, and carry other attributes farmers and consumers look for. Of particular note in crop development was open-pollinated zinc maize, released in Honduras, and quickly followed by other countries in the region.

Delivery Science and Developing Lessons Learned. HarvestPlus engaged in several partnerships along crop value chains to scale up biofortified crops, with an aim to benefit one billion people globally by 2030. These include both supply “push” partnerships – which get biofortified seeds into the hands of farmers – and demand “pull” partnerships – which catalyze the food sector and increase consumer awareness of the nutritional benefits of biofortified foods, to generate demand further up the value chain. Just as partnerships with NARS resulted in the official release of various biofortified crop varieties, partnerships with seed companies, civil society, and humanitarian organizations resulted in the multiplication and delivery of biofortified planting materials. HarvestPlus monitoring and evaluation data showed that in 2017, 3.6 million farming households acquired biofortified planting material across nine countries through a variety of distribution channels all catalyzed, supported, and/or trained by HarvestPlus (Tables A-1 and B).

- Households reached with **iron beans** in: Rwanda – 561,100; Democratic Republic of Congo – 240,000; Uganda – 128,700; and Zimbabwe - 78,100
- Households reached with **iron pearl millet** in India – 93,300
- Households reached with **orange sweet potato** in Uganda – 164,800
- Households reached with **provitamin A cassava** in: Nigeria – 604,000 and Democratic Republic of Congo – 279,100
- Households reached with **provitamin A maize** in: Democratic Republic of Congo – 83,600; Nigeria – 220,000; Zambia – 255,600; Zimbabwe – 27,000
- Households reached with **zinc rice** in Bangladesh – 561,100
- Households reached with **zinc wheat** in: India – 208,200 and Pakistan - 142,700

Monitoring surveys conducted in several countries showed that a significant proportion, ranging by country between 85 and 99 percent, of recipients have planted biofortified planting material, and 95 to 99 percent of households, the target beneficiaries – women of child bearing age and children under age 5 – were consuming the biofortified harvest. According to HarvestPlus’ global households reached projection model, which estimates the net annual number of households growing and consuming biofortified crops across 13 countries including Latin America and the Caribbean, by the end of 2017, 6.7 million households – 33 million people – were growing and consuming biofortified crops. Details on the model are not yet published, but can be provided upon request.

Promoting an Enabling Environment. New evidence on the nutritional impact of iron-biofortified staple crops reinforced prior research, offering a road map for policymakers to consider as they develop strategies to end hidden hunger. To date, eleven countries in sub-Saharan Africa have included biofortification in [national policies or strategies](#) (Table B). One of our 2017 case studies describes results from an RCT that showed iron beans were found to have a profound effect on cognition: iron deficient women who ate biofortified beans experienced improved memory and

ability to pay attention, key skills for optimal performance at school and work (Table A-2). A 2017 review in [Current Opinion in Biotechnology](#) shared these results along with similarly positive results from efficacy trials involving [adolescent boys and girls in India](#). Two special issues were published on the impact of biofortification: (1) the [Annals of the New York Academy of Science](#) examined aspects of biofortification ranging from developing a global regulatory framework to metabolic engineering to issues surrounding availability, production, and consumption of biofortified crops, and (2) the [African Journal of Food, Agriculture, Nutrition, and Development](#) contained 17 peer-reviewed articles on the evidence landscape for and beyond Africa, and lessons learned from the development, delivery, and promotion of biofortified crops and foods throughout Africa. A review of biofortification evidence was published in [Global Food Security](#), while a seminal paper on the role of agriculture and biofortification in the UN Decade of Action on Nutrition was published in the [UNSCN News 42: A Spotlight on the Nutrition Decade issue](#).

Flagship 3: Food Safety

Evidence that Counts. Several 2017 publications generated evidence for improved action on foodborne disease. Important studies on food hazards and foodborne disease risk factors in livestock value chains were published, finding several food safety technologies promising. These included [insect control in markets using nets](#); bacteria that can reduce aflatoxins in food; [kernel sorting](#) to reduce mycotoxins in maize; and [excreta storage systems](#) that reduce pathogens (Table D-2). All technologies were effective and are expected to move towards delivery. More mixed results came from evaluations of new approaches including Good Agricultural Practices in smallholder farms and [livestock insurance](#), which require further development for sustainability. Another set of papers focused on improved surveillance for foodborne and other diseases, with methods including [syndromic surveillance](#), [time series analysis](#), and climate modelling. Important scientific contributions included papers in a high-impact factor special edition and two chapters on dairy pathogens for a major textbook. In addition, an important RCT on the impacts of aflatoxin on stunting was finalized and is awaiting publication, while 11 technical papers on aflatoxins that had been endorsed by the East African Community (EAC), (prepared with support from USAID and IITA) were converted into [nine policy briefs](#) for further deliberations by the EAC's Sectoral Council on Agriculture and Food Security.

Safe Fresh Foods. In 2017, new work started on the dairy value chain in Kenya, pig value chain in Viet Nam, and pig and poultry value chains in Cambodia. Associated publications assessed previous experiences and present hazards, including the first quantitative risk assessment for [salmonellosis in Viet Nam](#). This information allows decision makers to systematically prioritize foodborne diseases. These initiatives are allowing us to test assumptions underlying the theory of change, which so far continues to be supported. Major policy-related achievements in 2017 were contributions to the development of briefs summarizing key learnings from Uganda and Ethiopia, which were shared with stakeholders and complemented a widely disseminated video. Other important policy relevant initiatives in 2017 included a [white paper on food safety for USAID](#); the [Lancet Count Down on Health and Climate Change](#); a [high-level food safety meeting in Brussels](#); dissemination of results of a World Bank-commissioned food safety situational analysis for Viet Nam; and three major food safety investment initiatives led by the Bill & Melinda Gates Foundation (BMGF) and DFID, the Global Food Safety Partnership, and the World Bank respectively.

Aflatoxin Mitigation. In 2017, great strides were made in expanding access to, and awareness and use of, Aflasafe (Tables A-1, D-1, and D-2). Aflasafe commercialization strategies were developed with Dalberg for Nigeria, Kenya, Senegal, and Gambia. Manufacturing and distribution responsibilities of Aflasafe SN01™ were transferred to BAMTAARE SA, a private company in Senegal, as described in our 2017 case study (Table A-2). The Aflasafe Modular Manufacturing Plant in KALRO-Katumani in Kenya produced 20 tons of Aflasafe in December 2017; official commissioning of

the plant will occur in 2018. The director of the [National Irrigation Board \(NIB\) of Kenya expressed appreciation](#) for the technology and the willingness of NIB to continue treating maize under their programs to attain aflatoxin-safe levels. A small-scale, lab-based facility in Dar es Salaam opened in 2017 to decentralize production from Ibadan and manufacture products for experimental use in Zambia, Mozambique, Malawi, and Tanzania. Aflasafe BF01™ was approved in May 2017 for use in both maize and groundnut in Burkina Faso. Dossiers to register Aflasafe products for use in Ghana and Tanzania were submitted to regulatory authorities. Aflasafe was included as an aflatoxin mitigation tool in the National Food Security Investment Plans (NAFSIPs) of Tanzania, Nigeria, Malawi, Senegal, Gambia, and Uganda. A4NH's role in increasing aflatoxin awareness and the successful use of Aflasafe to reduce aflatoxin to safe levels was highlighted in several [media outlets](#), all curated on the re-launched Aflasafe website (www.aflasafe.com). Other 2017 achievements were the development of a national communication strategy for use of Aflasafe KE01™ in Kenya, with support from USAID; a side event on Aflasafe commercialization at the 2017 World Food Prize event; instructional and informational [YouTube videos](#) in English and local languages; and a manual of aflatoxin management strategies for West Africa.

Flagship 4: Supporting Policies, Programs and Enabling Action through Research (SPEAR)

Nutrition Sensitive Agriculture Programs (NSAP). In 2017, research from several agriculture, nutrition, and health program evaluations were published and disseminated as part of country, regional, and international events (Table D-1). Some key publications were evaluations of an integrated child malnutrition prevention and treatment package in [Burkina Faso and Mali](#), helping program implementers, policymakers, and investors prioritize, select, and scale up the best program models to prevent and treat acute malnutrition; a childcare center-based integrated nutritional and agricultural intervention in [Malawi](#); and several from the Alive & Thrive evaluations in Bangladesh, Ethiopia, and Viet Nam. A [synthesis of the literature on nutrition-sensitive agriculture since 2014](#) was published as an IFPRI Discussion Paper and prepared for publication in *Global Food Security* (forthcoming). One conclusion was that by combining with other components, nutrition-sensitive agricultural programs become more effective, but also increase in complexity, which is a challenge for replicability and scale-up. IFPRI and the Society for Implementation Science in Nutrition co-hosted a session on program-research partnerships on implementation science at the International Congress of Nutrition. Presentations featured work from key Flagship 4 partners Helen Keller International (HKI), Alive & Thrive, and Save the Children. Data collection and analysis continued for studies in Ghana, Bangladesh, and India, including the joint Flagship 3 and Flagship 4 dairy value chain study in Nairobi. With the World Food Program (WFP), Flagship 4 worked to increase capacity to design and implement nutrition-sensitive programs; the 2017 achievement is described in Table B.

Supporting Country Outcomes through Research on Enabling Environments (SCORE). In India, the IFPRI-led Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition ([POSHAN](#)) produced several academic outputs and provided support at the district, state, and national levels for engaging in discussion around nutrition data and increasing demand for policy-relevant evidence (Table D-1). For example, their [district nutrition profiles](#) draw on diverse sources of data to compile a set of indicators on the state of nutrition and its cross-sectoral determinants. They serve as conversation starters at the district level about why undernutrition levels are high, and which factors might need to be addressed to improve nutrition. The special issue of *Global Food Security* on [Stories of Change in Nutrition](#) brought together findings from six countries and stakeholders were engaged to develop stories of change for Rwanda, Tanzania, and Viet Nam (Table B). Transform Nutrition ended in 2017 and produced a '[key issues guide](#)' which summarized research it has done on how to choose the best interventions and delivery strategies to scale up nutrition. Recognizing Transform Nutrition's wide influence, BMGF invested in [Transform Nutrition West Africa](#) (2017-2021) for nutrition knowledge generation and mobilization across the region (Table A-2). Flagship 4 joined Data for Decisions to Expand Nutrition Transformation ([DataDENT](#)), a new initiative

(2017-2021) that aims to transform the availability and use of nutrition data by addressing gaps in nutrition measurement and advocating for stronger nutrition data systems. This was the last year of Advancing Research on Nutrition and Agriculture (ARENA)'s first phase, and findings were presented to the funder, BMGF, and once to Bill Gates in a learning session on food affordability.

Capacity, Collaboration, Convening (3C). Engagement with the Scaling Up Nutrition (SUN) Secretariat continued in 2017, including development of guidance for building political commitment for nutrition among country focal points. A toolkit, part of a Knowledge for Implementation and Impact Initiative (KI3) report, was launched at the SUN Global Gathering, leading to recommendations on a knowledge network for the SUN Movement. A proposal for a program on understanding the role of capacity in impact pathways was completed and components have been incorporated into ongoing joint work with the SUN Secretariat on functional capacity development. With strategic partner the Institute for Development Studies (IDS), the Transforming Nutrition short course trained nutrition leaders, connecting them to a growing and influential leadership network, which is described in one of our case studies. With North-West University, the African Nutrition Leadership Programme (ANLP) short course was held, incorporating aspects of leadership influence needed for both SUN and the Comprehensive Africa Agriculture Development Programme (CAADP) processes. A4NH continued to engage with the Rome-based agencies, providing the latest evidence on nutrition-sensitive policies and programs (see I3 in Table D-1). Progress was made on collaborating with the International Fund for Agricultural Development (IFAD) on finalizing a theory of change on how international food and agricultural development agencies use research and how research organizations can deliver knowledge and evidence more effectively.

Flagship 5: Improving Human Health

Diseases in Agricultural Landscapes. ILRI finalized several studies demonstrating linkages between land use change and occurrence of zoonotic diseases. One showed that [flood irrigation](#) in arid regions of Kenya increases the risk of several mosquito-borne infections but reduces risks of directly transmitted zoonoses. Another Kenyan study showed the [risk of infection by *Brucella* spp. declined](#) with increasing distance from game reserves in parallel with declining livestock and wildlife densities. A third study conducted in Zambia and Zimbabwe showed that increased agricultural farming led to a [reduction in tsetse and trypanosomiasis risk in livestock and humans](#). A fourth revealed areas not previously thought to be at risk from Rift Valley fever could in fact support some degree of [environmentally lined transmission](#). In summary, these studies showed how land use changes influence the risk of zoonotic diseases, and this understanding will be used to identify opportunities for agricultural intensification to reduce disease burden. One area already moving forward is a collaboration between LSTHM and IITA in West Africa on links between rice and malaria. A preliminary study confirmed that alternate wet/dry methods of irrigation do reduce the number of mosquitoes produced by the rice fields, but also require additional inputs and reduce yield. Meanwhile, in Viet Nam, work was identified on seasonal patterns of transmission and risk factors for agriculture-related infections such as Japanese encephalitis, Shigella, and dengue.

Emerging and Neglected Zoonoses. A large number of papers were published in 2017 identifying zoonotic disease threats in rural and urban populations and in food systems in Kenya, with a particular focus on risk groups of agriculture-based workers. Researchers have been working with government partners and policymakers to design improved zoonotic disease surveillance systems, and direct policy advice has resulted for Rift Valley fever (see case study), Middle East Respiratory Syndrome Coronavirus, Brucellosis (see case study), antimicrobial resistance (AMR), rabies, and cysticercosis (Tables A-1 and D-1). Flagship 5 has prioritized cysticercosis work at a regional and international level, with planned studies (underway from 2017) to quantify the burden in humans, the prevalence and distribution in pigs, the impact on acquired epilepsy, and the risks in the food chain. Ongoing work through A4NH with partners will lead to large-scale intervention programs.

Global Challenges on Agriculture and Health. In 2017, work focused on insecticide resistance and AMR. New evidence on the role agricultural insecticides may play in generating resistance in disease vectors was collected in West Africa. For AMR, research on antimicrobial use and AMR in dairy food chains in India and Kenya demonstrated AMR genes and antimicrobial residues, and highlighted the lack of awareness of AMR among livestock producers. Considerable progress was made on characterizing AMR genes in livestock, humans, and the environment in a study system in Kenya, which will be used to determine the flow of AMR genes between them, while work there on antimicrobial stewardship in hospitals and on drug sales for livestock is near completion. Collaboration between ILRI and LSHTM on AMR was initiated with a study of methods for assessing antimicrobial use in livestock and human systems, followed by an international workshop to explore harmonization of methods. Researchers with projects surveying antimicrobial use in livestock (ILRI) and humans (LSHTM) in Africa and Asia met and agreed upon collaborations for 2018. The other aim of this cluster – to bring together agricultural and public health communities – focused on producing this workshop and developing workshops for 2018 on agricultural landscapes and disease.

1.3 Cross-Cutting Dimensions

1.3.1 Gender

Approximately 41 percent of A4NH’s completed 2017 deliverables had a gender dimension (Table C).

- An IFPRI discussion paper identified types of strategies employed by 13 agricultural development projects within the Gender, Agriculture, and Assets Project Phase 2 ([GAAP2](#)). The authors distinguish between [reach, benefit, and empowerment](#) as objectives of agricultural development projects, a new framework that has been introduced across A4NH, CGIAR, and externally. GAAP2 is adapting and validating a measure of women’s empowerment agricultural development projects can use to diagnose key areas of women’s (and men’s) disempowerment, known as the project-level Women’s Empowerment in Agriculture Index, or the pro-WEAI.
- A4NH’s Gender Nutrition Idea Exchange (GNIE) blog continued its steady growth of readership since it was launched in 2014. There were 15,078 views in 2017 (a 49 percent increase from 2016) with the post [A Framework for Measuring Women’s Empowerment at Multiple Levels](#) viewed more than 2,000 times.

1.3.2 Youth

Approximately 6.5 percent of A4NH’s completed deliverables in 2017 had a youth dimension (Table C). This remains an evolving area of research for A4NH, and we have plans to explore it as a dimension of equity in 2018 following the [external review on equity](#). In addition, an on-going program evaluation in Flagship 4 focuses on adolescents as a target group for health and nutrition services and interventions.

1.3.3 Other Aspects of Equity / “Leaving No-one Behind”

Social protection describes a variety of interventions provided by governments to support vulnerable populations. Two of our 2017 outcome case studies describe how evaluation research through PIM and A4NH helped make social protection programs in Bangladesh and Ethiopia more nutrition-sensitive and effective.

1.3.4 Capacity Development

Capacity building in A4NH takes two tracks: one focuses on the capacity to undertake research and the other on the capacity to use and apply research outputs in decisionmaking. At least 121,000 individuals (including farmers/producers, value chain actors, researchers, civil society, and policymakers) received training through A4NH in 2017 (Indicator C4 in Table D-1).

- Under Flagship 3, a comprehensive training was conducted for EAC members on aflatoxin management strategies centered on the use of Aflasafe in the maize and groundnut value

chains. The course was supported by the EAC secretariat to foster integration of policy on aflatoxin and mitigation strategies across the region for increased trade. The same training was conducted for officers of Nigeria's National Agency for Food Administration and Control and the Federal Ministry of Agriculture and Rural Development to strengthen the capacity of these agencies to fulfill oversight and regulatory roles.

- Short courses conducted through Flagship 4 – Transforming Nutrition with IDS and the ANLP short course with North-West University – built capacity among a combined total of 47 policymakers to apply research outputs in decisionmaking. One of our 2017 outcome case studies describes how past course participants have used knowledge gained to contribute to improved national policies and programs relevant to nutrition in their home countries.
- In Flagship 5 under the work on insecticide resistance and AMR, a training in mixed methods research, reading drug labels and digital data collection was held in Viet Nam for junior researchers and students from national research organizations. Participants practiced the skills over 5 months (which included interactive feedback). Further activities focused on facilitating interactions and discussions on AMR among CGIAR researchers from A4NH and Livestock and researchers of the public health and veterinary sectors.

At least 1,000 individuals participated in A4NH knowledge exchange activities in 2017, which indirectly had capacity building outcomes (Indicator C3 in Table D-1).

- Gender researchers from Flagship 4 and the Gender, Equity and Empowerment Unit engaged in several knowledge exchanges in 2017, reaching 136 researchers, funders, implementers and policymakers through a webinar titled "Gender and women's empowerment in nutrition-sensitive agriculture: New evidence and implications for programming", organized by the FAO Technical Network on Gender, a similar seminar for the International Development Research Centre in Ottawa, and a peer learning session titled "Identifying Levers of Empowerment in Agriculture: Lessons from Africa and Asia" at the Women's Economic Empowerment Forum.
- A capacity strengthening event for SUN focal points was conducted at the [SUN Global Gathering](#). The outcomes of the session will be used to develop training materials for additional capacity strengthening activities in collaboration with the SUN Secretariat.

1.3.5 Open Data

With the features embedded in MARLO, we will be able to systematically assess the number of open access publications and datasets reported to A4NH (Indicator C5, Table D-1). Among the 241 peer-reviewed publications in 2017, 75% are open access. In many flagships, W1/W2 resources are used to cover fees associated with making these types of research outputs open access. In the [2018 POWB](#), we described a PMU-led initiative to identify existing datasets associated with the A4NH research portfolio from Phases I and II, as part of an overall effort to help strengthen the Managing Partners' capacity to compile and make datasets available for secondary analysis and comparative studies. Results will be shared in our 2018 annual report.

1.3.6 Intellectual Assets

The majority of intellectual assets reported to A4NH in 2017 included knowledge, databases, publications, and other information products. All information products produced by A4NH are, wherever possible, disseminated using open access principles, with clear branding to recognize those responsible for producing the intellectual asset; our 2017 results are included in this report (Table D-1). Management of intellectual assets, such as germplasm, plant variety rights, trademarks, diagnostic tests, and other technologies takes place at the managing or strategic partner level, in compliance with CGIAR Principles. For 2017, IITA reported the [registration of the biopesticide Aflasafe BF01](#) for use in Burkina Faso (Table E).

2. CRP Effectiveness and Efficiency

2.1 Variance from Planned Program

Significantly expanded promising research areas. Food systems research is highly demanded and evolving rapidly. Currently, there are tremendous knowledge and evidence gaps on diets and food systems transformation in low- and middle-income countries. One particular area of research expansion is in urban food systems. In 2017, WUR collaborated with FAO on an urban food system proposal for Dhaka supported by the Embassy of The Netherlands in Bangladesh, now being finalized into a project. Proposals leading to research projects are also being developed for urban food systems in Africa – including Accra, Kampala, Lagos, and Cape Town – with various partners such as the European Commission and African Union Commission. Expanding in Flagship 1 is research on fruits and vegetables with several proposals and projects with public and private sector partners and the World Vegetable Center. In 2017, A4NH was heavily involved in important but unplanned activities to generate investment advice for food safety globally, in Africa, and in three priority African countries. In all cases, donors and INGOs requested our inputs, which reflects the growing interest in food safety in informal markets and recognition that Flagship 3 is one of the very few research groups with a substantial track record in this area.

Dropped or significantly cut research lines. Research areas and objectives remain mostly consistent with what was described in the A4NH Full Proposal for Phase II. As part of the ILRI reorganization, the major area “on hold” for Flagship 3 is aflatoxin research within ILRI. This was previously led by an aflatoxin specialist who left ILRI two years ago and the aflatoxin platform he established has not found a replacement. With the division of CRP Livestock and CRP Fish, and Livestock’s subsequent value chain prioritization in Phase II, Flagship 3 has adjusted its focus accordingly. Flagship 5 planned to host an international meeting across agriculture and public health in 2018, but following discussions with public health partners, including the Swiss Tropical and Public Health Institute, this was changed to a series of focused, problem-led meetings, which started in 2017 and will continue.

New directions. None to report for 2017.

2.2 Use of W1/W2 Funding

Across all of A4NH, 80 percent of W1/W2 funding was used for flagship research (Table F). For example, in Flagship 1, funds covered the analysis of food system situations from a dietary perspective, laying the groundwork for understanding narratives of policies and policymakers and existing healthy diet platforms, and selecting and starting PhD candidates and projects in the four focus countries. In Flagship 2, W1/W2 funds covered nutrition research (bioavailability, efficacy, and effectiveness), monitoring and evaluation (design of the M&E system, training of the team, development of tools and systems), knowledge management (formation of the team, needs assessment) and strategic and policy research (exercise to prioritize countries for intervention, designing adoption studies, work on the global and sub-national biofortification priority indices).

About half of this W1/W2 research funding was used to leverage a portfolio of W3 and bilateral grants (Table F). For example, in Flagship 5, W1/W2 funds were used to support the development of outcomes from mainly UK government-funded projects and provided a significant injection of funding to work on cysticercosis, which aims to become self-financing over the course of Phase II. The research activities covered by W1/W2 included costs associated with launching stakeholder engagement and conducting collaborative activities with partners. W1/W2 funds allowed Flagship 3 to co-sponsor with PACA the Aflatoxin in Maize Value Chain workshop in Dar es Salaam and enabled Flagship 5 to engage graduate fellows and partners from policy institutions and hold joint workshops for research around AMR and expanded work in West Africa. Strategic partnerships with GAIN (in FP1) and IDS (in FP4) were made possible with W1/W2 funds.

We estimate that approximately 10 percent of research project costs were associated with gender research. Beyond research funding that integrates gender, W1/W2 provided significant funding to specific gender-nutrition research, including 25 percent co-funding for the development and piloting of pro-WEAI. W1/W2 funding also supported a review of equity research in A4NH. The recommendations from this review will inform new equity research in all flagships in 2018-19, building on approaches used in our high-quality gender research.

2.3 Key External Partnerships

We highlight the new or strengthened external partnerships from 2017 here. More details are included in Indicator C2 in Table D-1 and Table G.

- A4NH, through ILRI, signed an [memorandum of understanding with NIN](#), the leading institute under the Vietnamese Ministry of Health, to strengthen collaboration in food safety research. Key areas of collaboration include the characterizing of food systems, testing of select food safety innovations, and measurement of food system transitions. A4NH and NIN will also share data in relevant areas and work together to cross-promote research findings and policy recommendations.
- On the demand side, Flagship 2 strengthened collaboration with food companies, such as PRAN in Bangladesh, to generate a market for biofortified harvest, and with the media in developed and developing countries to raise public awareness about hidden hunger and biofortification.
- Important partnerships in Flagship 3 in 2017 included investment initiatives undertaken by the World Bank and its Global Food Safety Partnership initiative.
- Flagship 5 established a new association with the Bridge Collaborative, an international, interdisciplinary initiative co-led by IFPRI, The Nature Conservancy, and PATH, which has rice and malaria as one of its key initial case studies. This will lead to joint events in 2018.
- GAIN remains an important Flagship 1 strategic partner to support the building of public and private stakeholder relations with a specific focus on activities related to food system innovations. IDS remains an important Flagship 4 strategic partner, bringing interdisciplinary expertise and experience in analyzing policy processes and the political economy of agricultural policy, as well as nutrition and health policy. In 2017, their external review of equity research in A4NH has led to engagement on specific pieces of work in other flagships that will begin in 2018.

2.4 Cross-CGIAR Partnerships (other CRPs and Platforms)

We highlight the new or strengthened CGIAR partnerships from 2017 below (full list in Table H).

- **With agri-food system CRPs (AFS-CRPs).** To improve coordination and avoid duplication, researchers in A4NH and **Livestock**, the two CRPs that include AMR as a research priority, identified areas of synergies, especially related to research on antimicrobial use. Plans were made to have joint workshop in 2018 to share experiences on antimicrobial use research. In Flagship 3, A4NH has aligned its food safety activities to Livestock's value chains, with 2017 activities in Burkina Faso, Ethiopia, India, Tanzania, Uganda, and Viet Nam. There has been less engagement with **Fish**, but A4NH remains open to collaboration and has covered fish-borne disease in policy initiatives and reports. A new partnership was developed on the subject of rice and malaria between **Africa Rice** and A4NH within Flagship 5; joint work is planned for 2018. In Flagship 3, identification of strains for development of Aflasafe products for use in Mali, Zimbabwe, and Cameroon started in collaboration with **MAIZE**, as well as a collaboration to integrate aflatoxin-tolerant maize varieties and hybrids with Aflasafe.
- **With integrative-CRPs (I-CRPs).** Flagship 5 established a partnership with IWMI, linking to existing research on water and malaria, and on urban agriculture and disease. This underpins a new collaboration between A4NH and **WLE**, with a joint conference planned for 2018.

2.5 Monitoring, Evaluation, Impact Assessment and Learning (MELIA)

- Per the evaluation plan submitted with our proposal, IDS completed an [external review of equity research in A4NH](#) in 2017 (Table I). The management response was drafted in 2017 and finalized by March 2018. Immediate actions were described in our [2018 POWB](#). The commencement of the joint evaluation/impact assessment of the IFPRI research program on Diet Quality and Health of the Poor (Global Research Program 24 – GRP24) was delayed until 2018.
- A significant 2017 MELIA activity was the launch of MARLO, the integrated online planning and reporting tool A4NH has been adapting with several other CRPs since 2016. Members of the PMU invested significant time in implementing and training users to generate the 2018 POWB from the system. The system, though neither fully operational nor adopted across the A4NH community, was supported by A4NH management and will be improved in 2018.
- Many other ongoing or completed evaluations are described throughout this report.

2.6 Improving Efficiency

In addition to the examples below, internal restructuring at ILRI and HarvestPlus in 2017 consolidated research programs to strengthen delivery and reduce management costs, respectively.

- Initial discussions between Flagship 1 and Friesland Campina (Nigeria) and Unilever (Viet Nam) opened an opportunity to expand on a PhD project related to fortification of milk products and sustainable nutrition, respectively, in 2018 and beyond.
- A partnership between WUR and IITA secured a Young Expert Programmes (YEP) grant from the Netherlands Water Partnership to add a scaling expert at IITA for Flagship 3, in-house expertise hitherto unavailable in A4NH, to conduct a study titled ‘Scaling of biocontrol of aflatoxin in Maize: lessons and pathways for improved food and nutrition security in Africa.’
- LSHTM and ILRI negotiated the appointment of an ILRI-funded nutritionist, Dr. Paula Dominguez-Salas, in LSHTM. With this close institutional link, LSHTM and ILRI have become much more efficient and dynamic, both in Flagship 3 and 5.

3. CRP Management

3.1 CRP Management and Governance

In its first year of Phase II, A4NH executed three important changes to its management and governance arrangements:

1. Management of A4NH shifted to put greater emphasis on the contributions of six Managing Partners - Bioversity, CIAT, IITA, ILRI, LSHTM, and WUR - plus IFPRI as the Lead Center. Each Managing Partner has a senior representative (Deputy Director General-level (DDG) or equivalent) on the A4NH Planning and Management Committee (PMC) with the Flagship Leaders, and have agreed-upon leadership roles such as flagship, cluster, country, or international partnership.
2. Country team coordinators or managers were appointed in all five A4NH focus countries: Bangladesh, Ethiopia, India and Nigeria (in early 2018), and Viet Nam. They work with an in-country team of four to six researchers from different CGIAR Centers and national partners working across flagships. Each country team has an annual workplan and budget.
3. Major programmatic changes were implemented in the scope and management of two flagships. The most substantive change from Phase I was to Flagship 1, now led by WUR, which studies national and sub-national food systems in four focus countries. Flagship 5, now co-led by ILRI and LSHTM, extends its human health research into the implications of expanded irrigation on human vector-borne viral diseases and to what extent antimicrobial use in livestock and fish contributes to AMR in human pathogens.

3.2 Management of Risks to Your CRP

Programmatic Risks. The revised and new flagships for Phase II, led or co-led by new, non-CGIAR, Managing Partners (WUR for FP1 and LSHTM for FP5) successfully completed their first year of

implementation. All flagships held regular flagship coordination and planning meetings, with at least one face-to-face meeting each. Flagship 1 has arguably the most complicated partner relationships, but the Flagship Leader has been very proactive in engaging all partners in cross-institutional grant proposal development to build the partnership.

Contextual Risks. The main contextual risks for A4NH are in understanding and managing expectations by stakeholders and partners. In our focus countries, the country collaboration efforts are expected to address national partner expectations in those countries. Overall collaboration with other CRPs increased. Collaboration with Livestock progressed well and there have been joint outputs with PIM and CCAFS, as described in this report. HarvestPlus coordinated biofortification research in CGIAR with multiple AFS-CRPs. This role is changing and will be the topic of a revised CGIAR biofortification strategy in 2018. A number of partners and donors have expressed appreciation for our strong emphasis to enhance performance management through MARLO.

Institutional Risks. The main CRP challenge is to ensure that Managing Partners contribute effectively and collaboratively. The revised A4NH PMC structure with DDG-equivalent Managing Partner representation allows for a more effective voice and buy-in. In 2017, we revised Center compliance in having policies and procedures for all provisions of the PPAs. Centers have largely put in place required policies and procedures including for research ethics.

3.3 Financial Summary

A4NH expenditure in 2017 was slightly higher than proposed in the 2017 POWB (+1.6 percent) with 9 percent higher expenditure in grants (Table J). Given the uncertainties of W1/W2 funding, most Managing Partners budgeted and expended around 80 percent of what had been allocated by the System Council. Given the expected stability of W1/W2 funding in 2018, Managing Partners plan to spend all the System Council allocation plus carryover from 2017. For 2017, FP1 and FP5 were at 90 percent expenditure and all other FPs close to or above planned expenditure. For CRP management and cross-cutting units, only 2/3 of planned budget was spent, due to some delays in replacing staff and delayed expenditure by some partners.

Table A: Evidence on Progress towards SLOs

Table A-1: Evidence on progress towards the SLOs (sphere of interest)

SLO Target (2022)	Brief summary of new evidence of CGIAR contribution to <i>relevant</i> targets for this CRP (with citation)	Expected additional contribution before end of 2022 (if not already fully covered).
<p>1.1. 100 million more farm households have adopted improved varieties, breeds, trees, and/or management practices</p>	<ul style="list-style-type: none"> • 3.2 million farming households grew and consumed biofortified crops in 2017, bringing the total number of farming households growing and consuming biofortified crops globally to 6.7 million (based on the HarvestPlus global households reached projection model). • More than 100,000 ha were treated with Aflasafe by 66,787 farmers during 2017, allowing production of maize and groundnut with safe aflatoxin levels (donor reports to BMGF and USAID). Large-scale use of Aflasafe contributed to improved food safety [e.g. in Nigeria 91% of samples had less than 20 ppb] and increased the income of smallholder maize farmers (average 11.5% more than regular maize). 	<ul style="list-style-type: none"> • Planned adoption studies from FP2 that will provide further evidence on A4NH’s contribution toward this target include: vitamin A cassava in Nigeria (2018; hybrid version of a monitoring survey and adoption study) and iron pearl millet in India (no date set). The HarvestPlus global households reached projection model provides these targets. • Through FP3, at least half a million hectares are expected to be treated by 2020. The number of treated hectares by 2022 is expected to be considerably higher. Other 2017 achievements (See Tables D-1 and D-2, plus Outcome Case Studies) provide evidence that A4NH is positioned to make significant contributions to this 2022 target.
<p>2.3. 150 million more people, of which 50% are women, without deficiencies in one or more essential micronutrients</p>	<p>No new evidence in 2017 beyond what’s presented above</p>	<ul style="list-style-type: none"> • Planned impact evaluations from FP2, typically RCTs with a focus on consumption/nutritional outcomes that will provide further evidence on A4NH’s contribution toward this include: iron beans in Guatemala (2018-19), zinc wheat in Pakistan (concept note being prepared), and multi-crops in India (2019). • The external evaluation of the IFPRI research program on Diet Quality and Health of the Poor (Global Research Program 24 – GRP24), which ran from 2003-2011 before becoming part of A4NH as FP4, may contribute evidence on A4NH’s contribution toward this target (expected to be completed in 2019).

<p>2.4. 10% reduction in women of reproductive age who are consuming less than the adequate number of food groups</p>	<p>No new evidence in 2017</p>	<ul style="list-style-type: none"> • A4NH aims to contribute to a 10% reduction in women of reproductive age who are consuming less than the adequate number of food groups in the each of the four priority countries of FP1. The changes are expected to come about from research on the drivers of and constraints to diet changes among target populations and food system performance related to healthier diets, from tested interventions designed to improve the performance of multiple nutrient-rich agri-food value chains, and from identified options to upscale effective food system innovations to large segments of target populations.
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Table A-2: List of New Outcome Case Studies from This Reporting Year (Sphere of Influence)

Title of outcome case study	Sub-IDO	Links to evidence
Aflasafe products protect maize and groundnut from aflatoxin contamination in more than 100,000 hectares in four countries in sub-Saharan Africa	2.2.1 Reduced biological and chemical hazards in the food systems 1.2.2 Reduced market barriers	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2028
BAMTAARE SA, the first private company licensed to manufacture and distribute Aflasafe SN01 for benefiting Senegal and The Gambia	2.2.1 Reduced biological and chemical hazards in the food systems 1.2.2 Reduced market barriers	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2213
Evidence from Rwanda showed that consumption of iron biofortified beans had a positive effect on cognitive performance of young women	2.1.2 Increased access to diverse, nutrient-rich foods CC2.1.3 Improved capacity of women and young people to participate in decision-making	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2214
Donors use evidence to inform their investment strategies that guide and support nutrition-sensitive programming and policies in West Africa	CC3.1.2 Increased capacity of partner organizations, as evidenced by rate of investments in agricultural research CC3.1. 3 Conducive agricultural policy environment	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2210
Stakeholders use A4NH evidence from program evaluations to inform decisions that guide and support nutrition-sensitive programming in Bangladesh	2.1.3 Optimized consumption of diverse, nutrient-rich foods CC2.1.1 Gender-equitable control or productive assets and resources	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2219
Policymakers use A4NH evidence to inform decisions that guide and support nutrition-sensitive strategies in Bangladesh	2.1.3 Optimized consumption of diverse, nutrient-rich foods CC3.1. 3 Conducive agricultural policy environment	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2220
Stakeholders use A4NH evidence from program evaluations to inform decisions that guide and support nutrition-sensitive programming in Ethiopia	2.1.3 Optimized consumption of diverse, nutrient-rich foods CC2.1.1 Gender-equitable control or productive assets and resources	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2207
Global nutrition leaders have applied learning from the Transforming Nutrition course in their work as program practitioners and policy makers	CC4.1.2 Enhanced individual capacity in partner research organizations through training and exchange CC4.1.4 Increased capacity for innovation in partner development organizations and in poor and vulnerable communities	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2211
Building a theoretical basis and public support for nutrition sensitive value chains	2.1.1 Increased availability of diverse nutrient-rich foods 2.1.2 Increased access to diverse nutrient-rich foods	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2221

Use of A4NH evidence led to improved risk assessment and risk communication benefitting up to 94 million consumers in Vietnam	2.2.2 Appropriate regulatory environment for food safety CC3.1.1 Increased capacity of beneficiaries to adopt research outputs	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2215
Use of Rift Valley fever decision support tools led to improved interventions benefitting an estimated 3.1 million smallholders in Kenya	2.3.2 Reduced livestock and fish disease risks associated with intensification and climate change CC4.1.1 Enhanced institutional capacity of partner research organizations	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2216
Knowledge of brucellosis epidemiology to support the development of a national brucellosis strategy to support 45 million Kenyans	2.3.2 Reduced livestock and fish disease risks associated with intensification and climate change CC4.1.1 Enhanced institutional capacity of partner research organizations	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2217
Analysis and collaboration lays the foundation for food system improvements in Ethiopia	CC4.1.1 Enhanced institutional capacity of partner research organizations CC4.1.3 Increased capacity for innovations in partner research organizations	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2218
Multi-sectoral policy platform used effectively to promote best practices and pilot programs around biodiversity in Kenya	1.3.1 Diversified enterprise opportunities 2.1.2 Increased access to diverse nutrient-rich foods	https://marlo.cgiar.org/projects/A4NH/study/Summary.do?cycle=Reporting&year=2017&studyID=2222

Table B: Status of Planned Milestones

FP	Mapped and contributing to sub-IDO	2022 Outcome	2017 Milestone	Milestone status	Provide evidence for completed milestones or explanation for extended or cancelled
FP1	<ul style="list-style-type: none"> • 2.1.1 • 2.1.2 • 2.1.3 	Partners, including value chain actors, use evidence from impact evaluations when making operational and investment decisions	At least 2 partners , including value chain actors, participate in the identification and design of at least 2 gender-sensitive interventions aligned with findings from CoA1 to improve diets in Ethiopia and Viet Nam	Completed	<p><i>Project documents available upon request.</i></p> <p>In Ethiopia. Euromonitor (private sector) identified for market data project. Project pitched at the Big Data Inspire Challenges and concept note and funding arrangements agreed with partners. Exploratory meetings with local CGIAR researchers held. Awaiting formalization of contract via GAIN.</p> <p>In Viet Nam. Choices International (foundation) and National Institute of Nutrition (public sector) identified as partners for the implementation of a front-of-packaging labelling intervention. Working on establishing the coordination of the overall project with NIN and in identifying calls for proposals to apply for funding. Began working with National Institute of Nutrition to develop a school-based intervention through school meals to improve children’s diets.</p>
FP2	<ul style="list-style-type: none"> • 2.1.1 	High-yielding micronutrient enhanced varieties developed and released in target and expansion countries	All 8 target countries release second-wave of tier 1 crops	Completed	<p><i>Project documents available upon request.</i></p> <p>Completed in 3 countries: released new varieties for pearl millet, rice and wheat in India; new variety for rice in Bangladesh; and new variety for cassava in DRC.</p> <p>HarvestPlus’s new strategic plan has identified 30 priority countries in which to introduce and/or scale up 13 biofortified crops by 2030. Starting with the 2018 POWB, language in outcomes and milestones was revised to be consistent with the new strategic plan.</p>

FP2	<ul style="list-style-type: none"> • CC3.1.2 • CC4.1.1 	Biofortification mainstreamed into CGIAR and NARS breeding efforts	5 CGIAR Centers develop a workplan and strategy in collaboration with HarvestPlus to operationalize 2014 commitment to mainstreaming	Completed	<i>Project documents available upon request.</i> Completed for 2 CGIAR Centers: developed one strategy with IRRI for rice and two with CIMMYT for maize and wheat.
FP2	<ul style="list-style-type: none"> • 1.4.2 • 2.1.1 	High-yielding micronutrient enhanced varieties delivered at scale in target and expansion countries	6.5 million HHs growing and consuming biofortified crops (6 million in target countries, 0.5 million in partnership countries)	Completed	Exceeded target. As per the global households reached projection model which is a running estimate of households benefiting from biofortified crops, 3.2 million farming households grew and consumed biofortified crops in 2017, bringing the total number of farming households growing and consuming biofortified crops globally to 6.7 million households . <i>A description of the model has not yet been published, but can be provided upon request.</i>
FP2	<ul style="list-style-type: none"> • 2.1.2 • CC2.1.3 • CC3.1.2 	Evidence on nutritional efficacy and impact informs value chain actors, as well as national and international investors	Ex ante impact and cost-effectiveness of biofortification and biofortification interventions are considered by national and international investors	Extended	Manuscript submitted in 2017 and published in 2018 in Global Food Security and presented at FAO-WHO consultation on biofortification in 2016. FAO-WHO review is on-going.
			Evidence on the impact of delivery programs on farmer adoption of iron beans in Rwanda and vitamin A maize in Zambia influence HarvestPlus and other programs' delivery of biofortified crops	Extended	Papers written and submitted to journals on farmer adoption for above-mentioned biofortified crops. Publication expected in 2018.
FP2	<ul style="list-style-type: none"> • CC3.1.3 	Biofortification supported by global institutions and incorporated into plans and policies by stakeholders	Biofortification is included in at least 2 additional global, regional or national strategies and policies	Completed	World Bank Africa and LAC regions have requested FP2/HarvestPlus' technical advice and guidance to include biofortified crops in agricultural transformation programs such as the West Africa Agricultural Transformation Program and East and Central Africa Agricultural Transformation Program (ECAAT)/ Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) , (Food and Agriculture Global Practice).

					Eleven countries in sub-Saharan Africa have included biofortification in national policies or strategies (more information here).
			The revised biofortification priority index (BPI 2.0) is available to partners for informing decisions on investing in implementing and evaluating biofortification projects	Extended	Revisions to the BPI will be made and BPI 2.0 re-launched in 2018-19.
FP3	<ul style="list-style-type: none"> • 1.2.2 • 2.2.1 • 2.2.2 • CC2.1.1 • CC3.1.1 • CC4.1.1 • CC4.1.2 	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	National partners in at least 2 countries (Viet Nam + TBD) engaged in review process on food safety in informal markets (which includes gender and equity aspects)	Completed	Partners are engaged in review process on food safety in informal markets in Viet Nam, Kenya, Cambodia and India (see presentations here and here , and webinar here) In addition, the governments of Tanzania, Nigeria, Malawi, Senegal, The Gambia , and Uganda included the use of Aflasafe products as an important mitigation tool in their National Food Security Investment Plans.
FP3	<ul style="list-style-type: none"> • 1.2.2 • 2.2.1 • 2.2.2 • CC2.1.1 • CC3.1.1 • CC4.1.1 • CC4.1.2 	Market-based food safety innovations delivered at scale in key countries along with understanding of their impact and appropriate use	1-2 CRP value chains for animal-source foods and/or produce identified for scaling up and out using incentive and market based approaches, coordinated with CRP Livestock, CRP Fish and others	Completed	Research from 2017 on the following value chains: pork in Viet Nam here and here and here , dairy in Kenya here , dairy in India here , meat and milk in Ethiopia here and here , and animal source foods in Cambodia here .
FP3	<ul style="list-style-type: none"> • 1.2.2 • 2.2.1 • 2.2.2 • CC2.1.1 • CC3.1.1 • CC4.1.1 • CC4.1.2 	Biocontrol and GAP delivered at scale in key countries along with understanding of their impact and appropriate use	39,000 farmers use biocontrol across 8 countries in sub-Saharan Africa	Completed	<i>Donor report submitted to BMGF and USAID available upon request.</i> Exceeded target. 66,787 farmers used Aflasafe across 4 countries in sub-Saharan Africa, to protect 105,000 hectares of maize and groundnut. Large-scale use of Aflasafe contributed to improved food safety [e.g. in Nigeria 91% of samples had less than 20 ppb] and increased the income of smallholder maize farmers (average 11.5% more than regular maize).

					Other 2017 achievements (See Tables D-1 and D-2 plus Outcome Case Studies) provide evidence that Flagship 3 is making progress towards achieving future year milestones and this 2022 outcome.
FP4	<ul style="list-style-type: none"> • CC4.1.1 • CC4.1.2 • CC4.1.4 	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	In collaboration with program implementers, evidence and evaluation tools developed in Phase I are used to develop proposals for assessing different nutrition- and gender-sensitive programs in 2 countries (to be determined in consultation with program partner (WFP) in 2017), each with a rigorous evaluation component included.	Completed	<i>Project documents available upon request.</i> A4NH researchers produced three concept notes for Honduras, Zimbabwe , and research across the different WFP program areas, and contributed to a full proposal with WFP for research associated with a school feeding program in Sri Lanka that was submitted to McGovern Dole.
FP4	<ul style="list-style-type: none"> • 2.1.1 • 2.1.2 • 2.1.3 • CC1.1.5 • CC2.1.1 • CC2.1.3 • CC3.1.3 	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	National policymakers and shapers, and stakeholders from different sectors, civil society and industry engage in policy environment analysis/stories of change in 7 focal countries: Bangladesh, Ethiopia, India (state level), Nepal, Tanzania, Viet Nam, and Zambia	Completed	The special issue of Global Food Security brought together the findings from 6 countries - Bangladesh, Ethiopia, India (Odisha), Nepal, Senegal, and Zambia – and stakeholders were engaged in 2017 - from Rwanda, Tanzania, and Viet Nam – with those stories of change expected to be completed by 2018-19.
FP4	<ul style="list-style-type: none"> • 1.3.2 • 2.1.1 • 2.1.2 • 2.1.3 • CC2.1.1 • CC2.1.3 • CC3.1.2 • CC4.1.1 • CC4.1.4 • CC3.1.1 	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	FP4 researchers and stakeholders work with SUN Secretariat to map and analyze current cross-sectoral nutrition-sensitive discourse and context to identify 3 researchable challenges for SUN policy support	Completed	<i>Project documents available upon request.</i> Engagement with the SUN Secretariat continued with development of guidance for building political commitment for nutrition among country focal points. A toolkit was launched at the SUN Global Gathering in November 2017 as part of KI3 a report on nutrition-relevant knowledge and knowledge providers leading to recommendations on a knowledge network for the SUN Movement.

		nutrition-sensitive policies			
FP4	<ul style="list-style-type: none"> • CC3.1.1 • CC4.1.1 • CC4.1.2 • CC4.1.3 • CC4.1.4 	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 nutrition-sensitive agricultural programming, nutrition-sensitive policymaking and implementation.	3 key capacity gaps identified through engagement with key partners from SUN, CAADP, and others in identified pathways at national, regional, international and subnational levels and cross-CRP to guide flagship capacity strengthening agenda and shape regional events in 2018	Completed	Several more than three functional capacity gaps were identified in a SUN Government Stakeholders Capacity Building Session at the Sun Global Gathering (<i>see p.21</i>). Work with SUN Secretariat to develop a capacity strengthening program to address these is on-going.
FP5¹	<ul style="list-style-type: none"> • 2.3.3 • 3.3.1 • 3.3.2 • CC2.1.3 	Agricultural research initiatives, including farming communities, measure health risks and benefits	Key areas of potential research collaboration identified and projects underway: (1) Research project to integrate datasets for analysis (if interactions are identified by holders of datasets) established and (2) Rice/mosquito research agenda agreed with rice researchers, staff recruited and fieldwork designed and initiated.	Completed	<p><i>Project documents available upon request.</i></p> <p>Collaboration established between IFPRI (HarvestChoice), LSHTM, Malaria Atlas Project and other organizations to assemble geospatial data on agriculture and health outcomes.</p> <p>Collaboration established with Africa Rice, IITA and LSHTM for rice/mosquito research.</p>
FP5¹	<ul style="list-style-type: none"> • 2.3.2 • 3.3.1 • 3.3.2 • CC2.1.3 • CC3.1.4 	Agricultural and public health policymakers and implementers deliver coordinated and effective solutions to cysticercosis and other zoonotic threats	At least 15 research organizations representing natural and social scientists from health and agriculture participate in theme-based symposia to identify and develop research areas, recognizing gender and equity issues.	Completed	<p><i>Project documents available upon request.</i></p> <p>An international workshop brought together AMR researchers from 24 institutions, including WHO, FAO, OIE, Fleming Fund and other research and NGO bodies to harmonize approaches to measuring AM use.</p> <p>The ANH Academy Week Conference in Kathmandu convened 430 researchers working across</p>

¹ Note for SMO: The FP5 milestones listed here were revised following submission of the 2017 POWB.

					agriculture, nutrition and health from 181 institutions in 31 countries in learning labs and the research conference. This event was organized by A4NH and LSHTM (LCIRAH) with local partners, contributing to interdisciplinary collaboration across A4NH flagships.
FP5 ¹	<ul style="list-style-type: none"> • 2.3.2 • 2.3.3 • CC4.1.1 • CC4.1.2 	Public and private sector policymakers implement measures to reduce human and animal health risks from antimicrobial resistance and other interactions	15 decision makers made aware of global maps of antimicrobial drug use in livestock keeping systems	Cancelled	With the departure of Dr Tim Robinson from ILRI, who was leading this activity, the antimicrobial resistance group consulted and refocused antimicrobial resistance work on assessment of local antimicrobial use and antimicrobial resistance and associated interventions. It was agreed that this was the more immediate need, and distinctive niche for LSHTM/ILRI contribution
			At least two sites identified for integrated research on AMR in human and livestock systems and methods in development for this integrated research	Completed	Under FP5, programs on biological and socioeconomic research on antimicrobial use and antimicrobial resistance in East Africa were brought together and initial discussions held with LSHTM to link to their East African work. Similar coordination was completed for Asian programs, now based or run from Vietnam .
			Public health community engaged and at least 5 intersectoral meetings on research integration held or fully planned	Completed	Meetings were held within LSHTM and ILRI to match up and initiate FP5 collaboration. Two workshops were held with public health participation on food safety (May, Brussels) and antimicrobial use (November, London) and two planned on agriculture/disease in West Africa (June 2018, Accra) and rice/malaria (August 2018, Stockholm). Also, FP5 elements were organized in the 2017 ANH Academy meeting (July, Kathmandu) and planned for the 2018 Meeting (June, Accra).

Table C: Cross-cutting Aspect of Deliverables

Cross-cutting	Number (%) scored 2 (Principal)	Number (%) scored 1 (significant)	Number (%) scored 0	Total number of deliverables
Gender	4.9% (9)	36.2% (67)	58.9% (109)	185
Youth	0	6.5% (12)	93.5% (173)	
CapDev	0	29.2% (54)	70.8% (131)	

Note: Data based on deliverables completed in 2017. For gender, A4NH researchers were not using the OECD scoring in 2017. Instead, A4NH used four categories: there is no gender dimension; *none* if the focus of the deliverable is on women or girls only, *some* if the deliverable includes some gender dimensions, but it's not the main focus; and *significant* if gender is the main focus of the deliverable. For the 2017 percentages for all three cross-cutting issues, A4NH thinks these are conservative estimates in the absence of guidance from CGIAR on what the scores really mean. As an example, for gender within A4NH, '0-not targeted' will include deliverables that have a singular focus on women and girls, which does not meet our definition of gender research, but other CRPs may include this as gender research and assign a '1' or even a '2.' Once definitions are available, A4NH researchers may feel more confident assigning a higher score. We look forward to receiving those definitions in time for 2019 planning or 2018 reporting.

Table D: Common Results Reporting Indicators

Note. Following the guidelines given to CRPs for their annual reports, *nearly all* policies, strategies, and investments at stage 2 (enacted/implemented) counted as part of indicator I3 have a corresponding outcome case study in MARLO. In some cases, evidence is not yet available online or the portrayal of the CGIAR contributions needed to be vetted by researchers and partners involved and there was not enough time to do so. We understand that innovations in stage 4 should have an outcome case study and all of innovations we're reporting, except for one, have a corresponding outcome case study in MARLO.

Table D-1: Key CRP Results from 2017, in Numbers

Sphere	Indicators	Data	Comments
Influence	I3. Number of policies/ investments modified in 2017, informed by CGIAR research	34 policies/investments 8 in Stage 2 (enacted) 26 in Stage 1 (taken up) - 6 of the 8 results for enacted national/sub-national policies/investments pertain to A4NH focus countries (Bangladesh, Ethiopia, India, and Vietnam)	
Control	C1. Number of innovations by phase	75 innovations 4 - uptake by next users 49 - available for uptake 10 - successful pilot 12 - proof of concept	Under-estimate. Social science innovations are likely under-represented from certain flagships.
	C2. Number of formal partnerships, by purpose	116 formal partnerships 31 - in Phase 3: Scaling up and scaling out 49 - in Phase 2: Piloting 29 - in Phase 1: Research 7 - in more than one phase	
	C3. Participants in CGIAR activities	3,318,526 individuals	Under-estimate. Sex-disaggregated data was provided for a small subset of this total. Does not include many study/trial participants or data from all managing partners.
	C4. People trained	121,149 individuals (54% women)	Under-estimate. Does not include data from all managing partners.
	C5. Number of peer-reviewed publications	241 in the A4NH Collection of the IFPRI e-brary 75% are open access	Total for 2017 will be higher than this number because the A4NH Collection is not limited to peer-reviewed publications.
	C6. Altmetrics		See note below and raw data provided to SMO.

Note on Indicator C6 (Altmetrics): For the 2017 annual report, all peer-reviewed publications reported to the A4NH Program Management Unit by July 9, 2018, were forwarded to the IFPRI Knowledge Management team for inclusion in the A4NH collection in the IFPRI e-brary. Altmetric scores were calculated based on 216 publications with known DOIs. Scores are as of July 10, 2018. Some selected highlights from A4NH:

- [The Lancet Countdown: tracking progress on health and climate change](#) in *The Lancet* reached 625 on Altmetrics. The article was tweeted about 594 times from nearly 500 tweeters, and mentioned in 36 news stories from 30 outlets, including [CNN](#), which cited it in a story on health impacts in Puerto Rico following the island's devastation by Hurricane Maria. It was also cited in the [World Health Organization South-East Asia Journal of Public Health](#), in an issue on addressing health impacts of climate and environmental change.
- Reflecting the global attention to the potential of antimicrobial resistance, [Reducing antimicrobial use in food animals](#) (*Science*) reached 437 on Altmetrics. The hot-button topic resulted in pickup in 31 news stories from all over the world, ranging from [Yahoo! News](#) to the [Times of India](#) to [New Scientist](#). It was also mentioned in 355 tweets from more than 300 tweeters, with an upper bound of 1.76 million followers.
- Micronutrient deficiencies are a global concern, prompting broad interest in information on health impacts of various micronutrients. [A moderate increase in dietary zinc reduces DNA strand breaks in leukocytes and alters plasma proteins without changing plasma zinc concentrations](#), published in the *American Journal of Clinical Nutrition*, reached 284 on Altmetrics, drawing 35 news stories from 30 sources, including outlets in Asia and those with targeted readership such as [Latinos Health](#). It was also mentioned in several blog posts and 79 tweets. Another article on this topic, [Consumption of Iron-Biofortified Beans Positively Affects Cognitive Performance in 18- to 27-Year-Old Rwandan Female College Students in an 18-Week Randomized Controlled Efficacy Trial](#) (*Journal of Nutrition*), reached 89 on Altmetrics and was picked up by three bloggers and mentioned in 158 tweets.
- The importance of A4NH work on health is reflected in attention received by program research related to disease. [The global burden of disease study 2013: What does it mean for the NTDs?](#), published in *PLoS Neglected Tropical Diseases*, reached an Altmetrics score of 227, and was cited in two [World Health Organization policy documents](#). It also received notable interest from social media, with 379 tweets reaching an upper bound of more than 850,000 followers.
- Increasing dietary diversity is key to improving the health and nutritional status of billions of people in low and middle-income countries. [Agrobiodiversity and a sustainable food future](#), which appeared in *Nature Plants*, laid out the case for why people eating too much of the same few foods is bad for the global population. Reaching 87 on Altmetrics, it was picked up in six news sources, including an op-ed in the [Houston Chronicle](#), and was tweeted about 29 times.

Table D-2: List of CRP Innovations in 2017 (From indicator #C1 in Table D-1)

Title of innovation	Phase of research	Novel or adaptive research	Contribution of CRP	Geographic scope
Aflasafe product for the Gambia and Senegal made available for commercial use	4 - uptake by next users	Adaptive	Lead	Senegal, the Gambia
Aflasafe product for Kenya	4 - uptake by next users	Adaptive	Lead	Kenya
Nutrition Sensitive Value Chains framework	4 - uptake by next users	Adaptive	Lead	Global
Multi-sectoral taskforce on food safety	4 - uptake by next users	Adaptive	Lead	Vietnam
Community outreach nutrition education materials	3 - available for uptake	Novel	Lead	Benin
Multi-sectoral policy platform to promote best practices and pilot programs around biodiversity in Kenya	3 - available for uptake	Adaptive	Lead	Kenya
Evidence on positive effects of consumption of iron biofortified beans in Rwanda	3 - available for uptake	Novel	Lead	Rwanda
Iron Beans: INTA BIODOR (SMR 88)	3 - available for uptake	Novel	Lead	Nicaragua
Vitamin A Orange Maize: MH44A	3 - available for uptake	Novel	Lead	Malawi
Zinc Rice: DRR Dhan 49	3 - available for uptake	Novel	Lead	India
Zinc Rice: Binadhan 20	3 - available for uptake	Novel	Lead	Bangladesh
Zinc Rice: BRR1 Dhan84	3 - available for uptake	Novel	Lead	Bangladesh
Vitamin A Orange Maize: LY1001-14	3 - available for uptake	Novel	Lead	DRC
Iron Beans: NCC 34	3 - available for uptake	Novel	Lead	.
Vitamin A Orange Sweet Potato: IDIAP C9017	3 - available for uptake	Novel	Lead	Panama
Vitamin A Orange Sweet Potato: IDIAP C0317	3 - available for uptake	Novel	Lead	Panama
Vitamin A Orange Maize: RAHA02 (HP942-15)	3 - available for uptake	Novel	Lead	Rwanda
Vitamin A Orange Maize: RAHA04 (HP942-12)	3 - available for uptake	Novel	Lead	Rwanda
Vitamin A Orange Maize: RAHA01 (GV665A)	3 - available for uptake	Novel	Lead	Rwanda
Vitamin A Orange Maize: RAHA03 (ST50-13)	3 - available for uptake	Novel	Lead	Rwanda
Iron Beans: ICTA Chorti-ACM (SMN 39)	3 - available for uptake	Novel	Lead	Guatemala
Zinc Wheat: HPBW-01 (Ankur Shiva)	3 - available for uptake	Novel	Lead	India
Zinc Wheat: WB-02	3 - available for uptake	Novel	Lead	India

Zinc Wheat: BARI-Gom33	3 - available for uptake	Novel	Lead	Bangladesh
Zinc Maize: DICTA B03	3 - available for uptake	Novel	Lead	Honduras
Zinc Maize: DICTA B02	3 - available for uptake	Novel	Lead	Honduras
Zinc Wheat: BHU-31	3 - available for uptake	Novel	Lead	India
Zinc Wheat: BHU-25	3 - available for uptake	Novel	Lead	India
Iron Beans: INTA BIOF100 (SMR 100)	3 - available for uptake	Novel	Lead	Nicaragua
Iron Millet: DHBH 1211	3 - available for uptake	Novel	Lead	India
Iron Millet: AHB 1200 (MH 2072)	3 - available for uptake	Novel	Lead	India
Iron Millet: HHB 299 (MH 2076)	3 - available for uptake	Novel	Lead	India
Vitamin A Orange Maize: Sammaz 52 (PVA SYN 13)	3 - available for uptake	Novel	Lead	Nigeria
Vitamin A Orange Cassava: YBI2011/323	3 - available for uptake	Novel	Lead	.
Vitamin A Orange Cassava: GKA 2011/274	3 - available for uptake	Novel	Lead	DRC
Vitamin A Orange Cassava: MVZ 2011B/360	3 - available for uptake	Novel	Lead	DRC
Aflasafe BF01 product for Burkina Faso and potentially 10 other countries in the Sahel	3 - available for uptake	Adaptive	Lead	Burkina Faso
Aflasafe product GH01 and GH02 for Ghana	3 - available for uptake	Adaptive	Lead	Ghana
Aflasafe product for Nigeria	3 - available for uptake	Adaptive	Lead	Nigeria
Development intervention: Pig diets for human nutrition and gender equity	3 - available for uptake	Novel	Lead	Uganda
Surveillance tool for improving disease control: Predictive mapping	3 - available for uptake	Adaptive	Lead	Vietnam
Research and policy tool: Risk assessment for food transmitted disease	3 - available for uptake	Adaptive	Lead	Uganda
Research tool: models for Rift Valley fever	3 - available for uptake	Adaptive	Lead	Regional: Sub-Saharan Africa
Research and policy tools: Research tool conceptual framework	3 - available for uptake	Adaptive	Lead	Global
Development intervention: guidance for program planning	3 - available for uptake	Adaptive	Lead	Regional: Western Africa
Surveillance tool for FBD: eSurveillance	3 - available for uptake	Adaptive	Lead	Kenya
Development intervention: TCM for Improving food safety	3 - available for uptake	Adaptive	Lead	Multi-country
Stories of Change approach	3 - available for uptake	Novel	Lead	Global

District nutrition profiles for India	3 - available for uptake	Adaptive	Lead	India
Implementation notes	3 - available for uptake	Novel	Lead	India
Pro-WEAI	3 - available for uptake	Adaptive	Lead	Global
Data notes	3 - available for uptake	Adaptive	Lead	India
Swahili translation of the Vicious Worm health information tool	3 - available for uptake	Adaptive	Lead	Regional: Eastern Africa
Solar panel drier for beans and amaranth in Kenya and Uganda	2 - successful pilot	Novel	Lead	
Aflasafe product ZM01 and ZM02 for Zambia	2 - successful pilot	Adaptive	Lead	
Aflasafe product TZ01 and TZ02 for Tanzania	2 - successful pilot	Adaptive	Lead	
Food safety technology: insecticide treated nets	2 - successful pilot	Adaptive	Lead	
Food safety technology: waste storage	2 - successful pilot	Adaptive	Lead	
Food safety technology: kernel sorting	2 - successful pilot	Adaptive	Lead	
Surveillance tool for FBD: Time Series Analysis	2 - successful pilot	Adaptive	Lead	
Risk Mapping tools	2 - successful pilot	Adaptive	Lead	
Training material for farmer field schools (FFS)	2 - successful pilot	Adaptive	Contributor	
AMUSE tool (KAP around antimicrobial use)	2 - successful pilot	Adaptive	Contributor	
Self reporting dietary intake tool for use in low literacy populations	1 - proof of concept	Adaptive	Lead	
Foresight tool for nutrition management practice in Vietnam	1 - proof of concept	Adaptive	Lead	
Experimental game played between input dealers and farmers	1 - proof of concept	Adaptive	Lead	
Aflasafe MWMZ01 product for Malawi and Mozambique	1 - proof of concept	Adaptive	Lead	
Aflasafe MW02 for Malawi	1 - proof of concept	Adaptive	Lead	
Food safety technology: genetic resistance & fertilizer	1 - proof of concept	Adaptive	Lead	
Research tool: metagenomics for improving food safety	1 - proof of concept	Adaptive	Lead	
Research tool: System dynamics model for improving food safety	1 - proof of concept	Adaptive	Lead	

Research and policy tools: food safety metrics	1 - proof of concept	Adaptive	Lead	
Disease control tool: insurance	1 - proof of concept	Adaptive	Lead	
Research and policy tool: One Health Economics	1 - proof of concept	Adaptive	Lead	
Research and policy tool: Health impact assessment	1 - proof of concept	Adaptive	Lead	

Table E: Intellectual Assets

Year reported	Applicant(s) / owner(s) (Center or partner)	Patent or PVP Title	Additional information	Link or PDF of published application/ registration	Public communication relevant to the application/registration
2017	IITA	Registration of the biopesticide Aflasafe BF01 for use in Burkina Faso	Registration granted for three years (2017-2019)	http://www.insah.org/doc/pdf/pesticides_autorises_40èè_s_ession_CSP_mai_2017.pdf	https://aflasafe.com/2018/04/10/what-next-after-aflasafe-bf01-registration-aflasafe-means-business-in-burkina-faso/

Table F: Main Areas of W1/W2 Expenditure in 2017

Expenditure area	Estimated percentage of total W1/W2 funding in 2017	Space for your comments
Planned research: principal or sole funding source	26%	includes estimated 10% gender related research expenditure
Planned research: Leveraging W3/bilateral funding	39%	includes estimated 10% gender related research expenditure
Catalyzing new research areas	16%	includes estimated 10% gender related research expenditure
Gender	3%	Gender, equity and empowerment research expenditure initiated by A4NH PMU
Youth	1%	
Capacity development	2%	
Start-up or maintenance of partnerships (internal or external)	10%	
Monitoring, learning and self-evaluation	1%	
Evaluation studies and Impact Assessment studies	2%	
TOTAL FUNDING (AMOUNT)	\$15,446,775 of \$79,836,235	See Table J

Table G: List of Key External Partnerships

FP	Stage of Research	Name of partner	Partner type	Main area of partnership
FP1	Phase 1: Research	Global Alliance for Improved Nutrition (GAIN)	International NGO	Collaboration on public-private partnerships
	Phase 1: Research	Power and Participation Research Centre (PPRC)	National/local research institution	Collaboration on baseline policy narrative analysis
	Phase 1: Research	Students from local universities (5)	University	MSc small grant scheme grantees
FP2	Phase 3: Scaling	SeedCo	Private company	To multiply and deliver vitamin A maize seeds
	Phase 3: Scaling	Nirmal Seeds	Private company	To multiply and deliver iron pearl millet seeds
	Phase 3: Scaling	World Vision	International NGO	To deliver biofortified crops through WVI programs
	Phase 3: Scaling	World Food Program (WFP)	International Organization	To include biofortified crops in programs, including Purchase for Progress and school feeding
	Phase 3: Scaling	PRAN	Private company	To generate a market for biofortified harvest
FP3	Phase 1: Research	World Bank	International/regional financial institution	Supporting situational analysis of food safety in Viet Nam; collaborating on two major food safety investment reports
	Phase 2: Piloting	Government of Cambodia	Government	Major partner on new food safety project
	Phase 2: Piloting	East African Community (EAC)	Regional organization	Aflatoxin policies and advocacy
	Phase 2: Piloting Phase 3: Scaling	Partnership for Aflatoxin Control in Africa (PACA)	Other	Advocacy and stewardship for aflatoxin mitigation
	Phase 3: Scaling	BAMTAARE SA	Private company	Manufacturing and distribution of Aflasafe SN01 in Senegal
FP4	All phases	Institute of Development Studies (IDS)	International/regional research institution	IDS co-leads CoA 4.2, leads one of the A4NH projects, and contributes to several research activities in the Flagship.
	Phase 1: Research	University of Ghana	University	EVIDENT contact and lead on capacity review
	Phase 1: Research	North-West University	University	ANLP collaboration, planning proposal writing and resource mobilization, review of leadership capacity gaps
	Phase 1: Research	World Food Program (WFP)	International Organization	Collaborated on development of concept notes and proposal for research on nutrition-sensitive programs
FP5	Phase 2: Piloting	ICAR-National Institute of Veterinary Epidemiology & Disease Informatics (ICAR-NIVEDI)	National/local research institution	By collaborating on the assessment of antimicrobial residues and resistance in dairy animals in India, ICAR-NIVEDI contributes to the field work and facilitates laboratory analyses. The findings of this research provide evidence on AMR and residues in dairy and help to design future projects and interventions.

FP5	Phase 1: Research	University of Queensland	University	PhD student conducts and coordinates project activities in Viet Nam, applying a systems approach to livelihood-sensitive veterinary antimicrobial stewardship in family-farming communities.
FP5	Phase 1: Research	University of Nairobi, Department of Veterinary Services	University	Field work in Kenya, providing leadership on policy dialogue for the development of more effective vaccination strategies for Rift Valley fever.
FP5	Phase 2: Piloting	Government of Kenya Zoonotic Disease Unit and County Governments	Government	Surveillance of zoonotic diseases in Kenya, with provision of access to national surveillance data and integration of project data to national recording.
FP5	Phase 2: Piloting	International laboratory collaborations (various)	Other	Diagnostic backstopping in various countries (Netherlands, UK, France, USA), with reference testing for pathogen detection and whole genome sequencing.

Table H: Status of Internal Collaborations among Programs and between the Program and Platforms

Name of other CRP or Platform	Brief description of collaboration (give and take among CRPs) and value added	Relevant FP
AFS-CRPs - mainly RICE, WHEAT, MAIZE, and RTB	<ul style="list-style-type: none"> • We explored, in food system consultations at national level and in bilateral discussions, opportunities with the AFS-CRPs (especially WorldFish, Livestock, RTB) and national partners for new W3/bilateral funding to integrate priority value chains in food system interventions to improve diet quality • Develop plans for Wheat, Rice, and Maize so that current breeding efforts for high micronutrient varieties can be mainstreamed into existing and new breeding investments. • Flagship 2 continued to work closely with Bioversity International, CIP, CIAT, CIMMYT, ICRISAT, IFPRI, IITA, and IRRI, in various areas including crop development, data exchange, socio-economic research and nutrition research. Flagship 2 continued to share its data and information on biofortification with these CGIAR Centers. • Search for atoxigenic strains native to Zimbabwe, Mali, and Cameroon was conducted in collaboration with MAIZE. Once Aflasafe products are developed for those nations, A4NH activities will start there. A4NH and MAIZE also pooled resources to cosponsor the Aflatoxin in Maize Value Chain workshop. 	<ul style="list-style-type: none"> • FP1 • FP2 • FP2 • FP3
AFS-CRPs - mainly Fish and Livestock	<ul style="list-style-type: none"> • We endeavored to align food safety activities to Livestock value chains and had activities in Ethiopia, Uganda, Tanzania, Viet Nam, India and Burkina Faso. We have also identified the need to develop a more systematic approach to sharing inputs and outputs between A4NH and Livestock. We have had less engagement with the CRP on Fish in 2017 but remain open to collaboration and have continued to cover fish-borne disease in our policy initiatives and reports. 	<ul style="list-style-type: none"> • FP3
I-CRPs –CCAFS, PIM, and WLE	<ul style="list-style-type: none"> • In food systems stakeholder consultations in the four key countries (Ethiopia, Nigeria, Viet Nam and Bangladesh), we will compile and assess relevant policies with PIM. • Promoted the understanding and use of gender and agriculture-nutrition methods, through the Gender-Nutrition Idea Exchange and the second phase of the Gender, Agriculture and Assets Project (GAAP2), with several opportunities facilitated by the CGIAR Collaborative Platform for Gender Research in PIM • Researchers from A4NH and CCAFS collaborated on the IFAD report, The Nutrition Advantage: Harnessing nutrition co-benefits of climate-resilient agriculture, and key messages summarized in a joint blog post by the CRP Directors • LSHTM convened public health researchers to discuss research opportunities with WLE on agriculture, water and vector borne disease and CCAFS on agriculture, climate change and disease. Collaborative links were also made by LSHTM with other A4NH flagships and CGIAR Centers, including IWMI and IFPRI (HarvestChoice). 	<ul style="list-style-type: none"> • FP1 & FP4 • FP4 & PMU • FP4 & PMU • FP5
Platform for Big Data in Agriculture	<ul style="list-style-type: none"> • Initial discussion with Platform for Big Data in Agriculture for collecting consumer intelligence data using Euromonitor as business model. 	<ul style="list-style-type: none"> • FP1

Table I: Monitoring, Evaluation, Impact Assessment and Learning

Table I-1: Status of Evaluations, Impact Assessments and Other Learning Exercises Planned in the 2017 POWB

Studies/learning exercises in 2017 (from POWB)	Status	Comments
Review of equity in A4NH in response to recommendations from our 2015 external evaluation.	Complete	Read the brief: https://a4nh.cgiar.org/files/2018/04/PN_2018_A4NH_Equity_Web.pdf
Joint evaluation/impact assessment (A4NH PMU & IFPRI) of the IFPRI research program on Diet Quality and Health of the Poor (Global Research Program 24 – GRP24), which ran from 2003-2011 before becoming part of A4NH Phase I as FP4 on Integrated Programs and Policies.	On-going	

Table I-2: Update on Actions Taken in Response to Relevant Evaluations (IEA, CCEEs and Others)

Name of the evaluation	Recommendation	Management response – Action Plan (available here)	By whom	By when	Status
Independent CCEE of A4NH (available here)	Establish clear boundaries around A4NH in the final Phase II proposal, clearly distinguishing two primary modalities of A4NH work: (a) A4NH’s ‘core’ research activities and (b) ‘A4NH value added activities’, supporting ANH work in the CGIAR and elsewhere.	Both research and value adding activities are specified in the Phase 2 pre-proposal. These will be further developed, in consultation with partners and other stakeholders, in the full proposal. Establish processes for determining which projects will be mapped to A4NH by partners centers and how W1/W2 funds will be used to support new research.	PMC, PMU	Mar 2016	Complete, see the A4NH Full Proposal for Phase II
			PMC	Mar 2016	Complete, see related content in the A4NH Governance and Management Handbook
	Build up a high-quality A4NH-branded core research program focusing on a few centerpiece research areas linked to the CGIAR Strategy and Results Framework.	We will continue to develop the A4NH research program through the Phase 2 proposal process, in consultation with partners and stakeholders, around the CGIAR SRF. We will seek and incorporate input from ISC, and use the proposal to guide fundraising efforts.	CRP Director, PMC	Mar 2016	Complete, see the A4NH Full Proposal for Phase II
	Make a coordinated investment in support to ‘value added’ ANH work across the CGIAR, managed as a coherent program, with clear goals and targets, adequate funding and human resources.	Clearly define mechanisms and processes for adding value to other CRPs, including expected activities, outcomes and budgets. An initial draft— including CoPs—was prepared for the preproposal and will be further developed for the proposal, in collaboration with other CRPs and following CO guidance and subject to resource availability.	CRP Director, PMC, Phase 2 flagship leaders	Mar 2016	On-going, see the A4NH Full Proposal for Phase II , as well as more specific activities described in A4NH’s annual POWBs and this annual report
	Adopt CGIAR standards of research quality as soon as these become available	State expectations and related processes in Phase 2 proposal. State expectations clearly in PPAs.	PMC, PMU	Mar 2016	Complete, see related content in the A4NH Governance and Management Handbook

	Adopt key CGIAR policies as soon as these become available	Review relevant polices, standards and other guidance with regard to suggested areas and ensure consistency with A4NH processes and strategies Revise A4NH strategies (e.g., Partnerships, Gender) as needed.	CO, PMU CRP Director	Mar 2016	On-going, , see related content in the A4NH Governance and Management Handbook and the A4NH Gender Strategy revised for Phase II
	Make a commitment to systematically address social equity issues,	Conduct a review of how best to integrate equity in A4NH. Incorporate equity into project management, building on synergies between attention to gender and other aspects of social equity.	PMU, CRP Director	Dec 2016	Review completed in 2017, see brief on major findings and recommendations . Implementation is on-going.
	Strengthen the A4NH monitoring and evaluation function	Work with CO and other CRPs on developing a shared monitoring system/platform through participation of PMU in IEA-supported Evaluation community of practice and CRP-supported Monitoring, Evaluation and Learning community of practice. Update and implement the A4NH evaluation plan, in line with IEA guidance.	PMU PMU, ISC	On-going Dec 2015	On-going, MARLO was launched in 2017. Adoption, standardization with managing partner systems (including IFPRI), and operational improvements are all works in progress. On-going. Plan is included in the A4NH Full Proposal for Phase II and progress described in A4NH's annual POWB and this report.
	Strengthen A4NH governance and management to support the above agenda	Operationalize conflict of interest policies in management and governance. Comply with CO guidance regarding governance structures for CRPs in Phase 2 In Phase 2, we propose to involve representatives of center management in the A4NH management committee and to redefine the role of Center Focal Points to be more technical than managerial. Conduct an assessment of internal and external communications needs to support key CRP management functions.	CRP Director CO, IFPRI, PMU	Dec 2016	Complete, see related content in the A4NH Governance and Management Handbook

Table J: CRP Financial Report

Flagships	Planned budget 2017			Actual Expenditure 2017*			Difference		
	W1/2	W3/bilateral	Total	W1/2	W3/bilateral	Total	W1/2	W3/bilateral	Total
FP1-Food Systems for Healthier Diets	\$3,760,000	\$6,129,582	\$9,889,582	\$3,063,401	\$5,749,740	\$8,813,141	\$696,599	\$379,842	\$1,076,441
FP2-Biofortification	\$3,500,000	\$28,792,300	\$32,292,300	\$3,145,672	\$32,913,961	\$36,059,633	\$354,328	\$(4,121,661)	\$(3,767,333)
FP3-Food Safety	\$3,465,000	\$8,279,289	\$11,744,289	\$2,856,861	\$9,615,054	\$12,471,915	\$608,139	\$(1,335,765)	\$(727,626)
FP4-Supporting Policies, Programs and Enabling Action through Research	\$3,765,875	\$15,288,945	\$19,054,820	\$3,051,200	\$15,060,316	\$18,111,516	\$714,675	\$228,629	\$943,304
FP5-Improving Human Health	\$1,915,000	\$720,156	\$2,635,157	\$1,430,988	\$945,014	\$2,376,002	\$484,013	\$(224,858)	\$259,155
CRP Management & Support Cost†	\$3,000,000		\$3,000,00	\$1,898,653	\$105,375	\$2,004,028	\$1,101,347	\$(105,375)	\$995,972
CRP Total	\$19,405,876	\$59,210,272	\$78,616,148	\$15,446,775	\$64,389,460	\$79,836,235	\$3,959,101	\$(5,179,188)	\$ (1,220,087)

*Source = Audited lead and participating Center 2017 financial reports.

†Management and Support Costs include monitoring & evaluation, gender, equity & empowerment and country coordination and engagement