RESEARCH PROGRAM ON

Agriculture for Nutrition and Health

CGIAR

Led by IFPRI

A4NH Annual Plan of Work and Budget (POWB) for 2017

CGIAR Research Program on Agriculture for Nutrition and Health

Led by the International Food Policy Research Institute

Bioversity International

CIAT — International Center for Tropical Agriculture — Since 1967 / *Science to cultivate change*

IFPRI

IITA — *Research to Nourish Africa*

ILRI — INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

WAGENINGEN UNIVERSITY & RESEARCH

Re-submitted to the System Management Office on March 20, 2017
Originally submitted to the System Management Office on February 17, 2017

A. CRP LEVEL

A1. Delivery

A1.1 Adjustments/changes to your Theories of Change
A4NH's results framework, flagship impact pathways, and theories of change remain unchanged from our Full Proposal for Phase II. All flagships (FPs) were funded. For newer FPs, FP1 and FP5, we will refine the theories of change and review the evidence base underlying them in 2017.

A1.2 Highlight expected Outcomes and Outputs[1]
Building on Phase I, we will expect a continuing stream of outcomes from FP2, FP3 and FP4. Through FP2, we will support actors to scale-out biofortification in target and partner countries with second and third wave germplasm providing benefits to 6.5 million households (~5 people per household). For governments and investors, FP2 evidence – on the efficacy of zinc crops and investment returns from synthesized impact evaluations, for example – will help them set priorities. Food safety evidence generated by FP3 on the sustainability of training and certification schemes for traders will be used by national regulators, and we will expect to see increased business engagement in several countries in Africa in scaling out aflasafe. Key partners from the Scaling up Nutrition Movement (SUN) and the Comprehensive Africa Agriculture Development Programme (CAADP) will strengthen their engagement in the FP4 agenda. A major outcome focus in Phase II will be to support national actors in food system transformation for healthier diets. With national actors in Ethiopia and Vietnam, FP1 will document the current state of food systems and start a similar engagement process in Bangladesh and Nigeria. We will also build upon preparatory consultations A4NH held with regional and global agriculture-health researchers to strengthen their engagement in joint projects and evidence reviews for decisionmakers as part of the new area of work on human health challenges associated with intensification of agriculture.

One management priority for 2017 will be to strengthen the performance of flagship teams and managing partners, supported by the establishment and implementation of the A4NH adapted version of MARLO for planning, monitoring, evaluation and reporting. We will strengthen our support to national stakeholders and CGIAR coordination through cross-FP country teams of A4NH researchers convened by an A4NH managing partner. Finally, we will examine how to enhance our contributions to poverty reduction through an analysis and plan on strengthening research on equity linked with our research on gender.

A.1.3 Use of different Funding Sources
At CRP level, A4NH will invest W1/W2 funding in research on methods and tools, particularly for foresight, evaluation, and impact assessment across the FPs. There will be three main cross-cutting uses of W1/W2 in 2017: (i) research on gender and equity to enhance agriculture's

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[1] The five A4NH Phase II focus countries are: Bangladesh, Ethiopia, India, Nigeria, and Vietnam. The four FP1 focus countries are: Bangladesh, Ethiopia, Nigeria, and Vietnam. The nine HarvestPlus target countries in FP2 are: Bangladesh, Democratic Republic of Congo, India, Nigeria, Pakistan, Rwanda, Uganda, and Zambia. The seven focal countries for FP4 are: Bangladesh, Ethiopia, India (state level), Nepal, Tanzania, Vietnam, and Zambia.

contributions to nutrition and health outcomes; (ii) evaluation and learning, integrating theory of change approaches into research for development to improve how research is planned and how progress towards outcomes is measured and monitored; and (iii) coordination and convening with a range of national partners from implementers to policymakers in A4NH's five focus countries. In these activities, W1/W2 funding will support new strategic research results and play an integrating role in bringing a nutrition and health dimension to agricultural research.

In 2017, 85% of the W1/W2 funding sources will be used for research carried out by the FPs (Table 1). For FP2, FP4, and part of FP3, other donors will provide a critical mass of W3/bilateral funding, so that a smaller percentage of W1/W2 (10-20%) can be used strategically for synthesis, learning, research on scaling up and out, and evaluation and learning with national partners. In FP1, FP5, and part of FP3, a higher percentage of W1/W2 (25-35%) will allow these newer FPs to shape a research agenda built upon formative research and to build partnerships. As research progresses, results should attract more W3/bilateral funding

A1.4 Planned revisions to your Program of Work
Our plan of work has not changed substantially from what was described in the Full Proposal. Rather, our 2017 POWB provides more detail on what we expect to achieve. Part of this specificity includes revisions to outcome milestones, which are listed in Table 3.

Table 1: CRP planned budget by flagship for 2017

Flagship Name	Planned Budget 2017 (USD millions)		
	W1/W2	**W3/bilateral**	**Total**
FP1 Food Systems for Healthier Diets	3.80	11.24	15.04
FP2 Biofortification	3.50	30.00	33.50
FP3 Food Safety	3.50	8.80	12.30
FP4 Supporting Policies, Programs and Enabling Action through Research	3.80	14.50	18.30
FP5 Improving Human Health	1.80	1.19	2.99
CRP Management and Support Costs	3.00	0.00	3.00
Total	**19.40**	**65.73**	**85.13**

A2. Collaboration and Integration

A2.1 Contribution to and from Platforms
Over the course of 2017, A4NH will develop details of our expected contributions to and from the CGIAR Platforms. Our first priority will be to explore collaborations with the Big Data Platform on food systems modelling, in particular, to use secondary data from the platform and more detailed

primary and secondary data from A4NH focus countries for joint analyses with resources from both. Our second will relate to the Gender Platform. A4NH will continue our close research partnerships with key researchers from the Platform in PIM with resources provided by each CRP. The third will be indirect, through the efforts of HarvestPlus. We will engage with the AFS-CRPs and crop Centers to mainstream breeding for micronutrients in more efficient and effective multi-objective breeding programs, as part of the Excellence in Breeding Platform.

A2.2 Cross-CRP interactions

We plan for six primary collaborations with other CRPs in 2017. (1) With Rice, Wheat, Maize, and RTB (plus Centers working on legumes), we will jointly develop plans so that current breeding efforts for high micronutrient varieties can be mainstreamed into existing and new breeding investments. (2) A4NH will provide food safety expertise to value chains led by the AFS-CRPs, mainly with Livestock and MAIZE. Given the changes in CGIAR animal source food value chain research, we will need to explore opportunities for joint food system and food safety research with both CRP Livestock and CRP Fish in 2017. (3) In Bangladesh and Ethiopia, we will work with PIM, CCAFS, and WLE to compile and assess relevant policies. In all four FP1 focus countries, we will explore, in food system consultations, opportunities with the AFS-CRPs and national partners for new W3/bilateral funding to integrate priority value chains in food system interventions to improve diet quality. (4) In order to disseminate the findings and lessons learned from Phase I agriculture-nutrition research, A4NH will convene interested CRPs and nutrition partners in South Asia for a series of events. (5) In FP5, A4NH will collaborate with Livestock on implications of antimicrobial use in animals. A4NH will focus on resistance in humans while Livestock will focus on efficacy and impacts in animals. A4NH managing partner, the London School of Hygiene and Tropical Medicine (LSHTM), will convene public health researchers to discuss research opportunities with interested CRPs. (6) We will continue to promote 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).

A2.3 Expected efforts on Country Coordination

Our expected contributions to CGIAR's Country Coordination initiative remain unchanged from what was described in the full proposal. Given our strong emphasis on country strategy and planning, we will coordinate with IFPRI's Country Strategy Support Programs (CSSPs) and in Africa through the ReSAKSS network. In other countries where A4NH is active, responsibility for supporting the Country Coordination Implementation Plans will be managed by individual FPs. In A4NH's five focus countries the new Country Coordination and Engagement Unit (part of the PMU) will form country teams and a coordinator for each team will be identified and will develop a work plan and budget for A4NH coordination and contributions to CGIAR Country Coordination activities. A budget of $50,000 is allocated from Management & Support Costs based on an agreed upon work plan to a managing partner – IITA in Nigeria, ILRI in Ethiopia, CIAT in Vietnam, and IFPRI in Bangladesh and India.

A3. Management, Governance and Monitoring, Evaluation, Learning

A3.1 Relevant Changes in Management and Governance

For 2017, A4NH flagship management will be as follows: FP1 Leader - Inge Brouwer, WUR; FP2 Leader - Ekin Birol, IFPRI-HarvestPlus; FP3 Leader - Delia Grace, ILRI; FP4 Leader - Stuart Gillespie, IFPRI; and FP5 Leader - Eric Fèvre, University of Liverpool/ILRI. Recruitment to replace Nancy Johnson, Senior Research Fellow in the Program Management Unit (and Planning and Management Committee member) will be underway. We anticipate some minor changes in governance, particularly the proposed role of the Independent Steering Committee (ISC), depending on deliberations and advice of the System Management Board. We will plan to continue with the Phase I Independent Advisory Committee and then finalize arrangements for the Phase II Independent Steering Committee in the second half of 2017.

A3.2 Monitoring, Evaluation, Impact Assessment and Learning Plans
A significant 2017 MEL activity will be the launch of MARLO, the integrated online planning and reporting tool that A4NH has been adapting along with the three other i-CRPs since 2016.

As per the evaluation plan submitted with our proposal, we plan to initiate two external evaluations in 2017. The first will be a review of equity in A4NH. It responds to recommendations from our 2015 external evaluation. The second will be a joint evaluation/impact assessment of the IFPRI research program on Diet Quality and Health of the Poor (Global Research Program 24), which ran from 2003-2011 before becoming part of Phase I A4NH as FP4 on Integrated Programs and Policies. The equity review will be completed in 2017, however the assessment of GRP24/FP4 will continue into 2018.

In addition, several impact evaluations will begin or continue within flagships. In FP2, the impact evaluation (effectiveness study) of high iron beans in Guatemala will continue and one on zinc wheat in Pakistan will begin. Impact assessments of iron bean delivery interventions in Rwanda, and vitamin A maize delivery interventions in Zambia will be finalized. A joint impact evaluation by FP3 and FP4 of the training and certification (T&C) scheme on milk safety and nutrition in Kenya will address a key gap in the evidence base for the theory of change for this innovation. FP4 will continue with a number of evaluations of the nutrition impacts of a variety of innovative approaches and platforms, such as the use of mobile technology supporting farmers, the impact of livestock interventions and the integration of nutrition-sensitive agriculture extension with strong gender focus.

B. FLAGSHIP LEVEL

B. 1 Delivery of FP1 - Food Systems for Healthier Diets

B.1.1 Expected Annual Milestones towards Outcomes 2022 [2]
As described in its FP impact pathway, FP1 will contribute directly to the Strategy and Results Framework (SRF) outcomes through both a value chain sub-pathway and a policy sub-pathway. It will also contribute indirectly by supporting other CRPs to consider impact on diets in their value chain and food system work. In 2017, an important outcome along the value chain pathway will be achieved when partners in two public-private initiatives in Ethiopia and Vietnam participate in the design of a gender-sensitive intervention aligned with the results of FP1's food system characterization (Milestone 1 for Outcome 1.2 in Table 3). Achievement of the milestone will be verified through program monitoring, reporting from partners, and the submission of a research proposal for evaluating the dietary impact of identified innovations

B.1.2 Outputs towards Outcomes 2022
In 2017, FP1 efforts will focus on developing, with national partners, food system assessments in four focus countries. Critical elements of these assessments are described below.

Methods, metrics and tools for assessing and analyzing diet-food system linkages. Activities in 2017 will focus on assessing consumption patterns and drivers and linking this to broader sustainability and policy indicators developed using available data from initiatives such as the CGIAR Big Data Platform, FAO/WHO Global Individual Food consumption data Tool (GIFT), the Global Dietary Database hosted by Tufts University, and national surveys. This initial analysis will help to identify data gaps and needs to adapt, or develop and test, new methods and tools. In 2017, FP1 will finalize food system characterizations for Ethiopia and Vietnam and start on Bangladesh and Nigeria, building on the knowledge and materials developed in FP4 to facilitate use of household consumption and expenditure data for dietary intake analysis.

Key leverage points identified for improving diets through food systems. Using existing and new data, key leverage points for food system innovations to improve diets, and the synergies and tradeoffs to other food system outcomes will be identified through modelling and foresight analysis activities, informing the research agenda for food innovations. This team will develop proposals for PhDs and postdocs and establish a country-level seed grant scheme to involve local universities and research institutes and conduct follow-up workshops with a smaller set of key stakeholders to identify potential food systems interventions.

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[2] Key outputs (in italics) for each flagship are based on the flagship impact pathway as portrayed in the A4NH Full Proposal. Our annual milestones track progress towards our 2022 outcomes, which map to a set of sub-IDOs that have not changed from PIM Table C in the full proposal. We base the indicators for the full set of sub-IDOs to which A4NH will contribute in Phase II (Table 2) largely upon the annual milestones. Please note that this table largely ignores cross-flagship collaboration because it is organized by flagship and we want to avoid repetition, so that is why some indicator and target columns are empty.

Evidence base on the effectiveness and impacts of food systems interventions. From these food system interventions options, research on testing interventions will be initiated. Research in Ethiopia will focus on assessing light processing and improved packaging and labelling of pulses for dietary impacts. In Vietnam, formative research will examine the constraints of informal vegetable value chain actors and assess food product labeling through a public-private partnership initiative. In Nigeria, the intervention assessments will examine effects of adding a consumer focus to African Development Bank-funded value chain projects in the Technologies for African Agricultural Transformation Program. Part of this work will include identifying alternatives to randomized controlled trials (RCTs), defining what constitutes a food system intervention, and refining a business assessment tool for private sector entry.

Policy process analysis and policy engagement. FP1 will conduct systematic reviews of food system related policies – including food system governance, use of nutritional guidelines, degree of engagement, and focus consumers – in all four of the FP1 focus countries. In addition, one country-level participatory scenario analysis of future food systems will be carried out. PhD and postdoc proposals will be developed focused on developing strategies and instruments for food systems policies for healthier diets, methodology for participatory food systems governance, and the role of consumers in influencing food system policies. We will contribute with CCAFS and WLE on cross-sectoral policy assessments, coordinated by PIM, in Bangladesh and Ethiopia.

Awareness and capacity among key partners and stakeholders, including other CRPs, about diet-food system linkages. In 2017, planned activities and deliverables include raising awareness of national and international policy guidelines and recommendations that promote the mainstreaming of agricultural biodiversity conservation and sustainable use for food and nutrition in focus countries, developing a strategy for developing a healthy diets platform, and working with MSc students and partners based in the FP1 focus countries and beyond to build capacity in analyzing nutrition linkages and applying nutrition- and gender-sensitive methodologies.

B.1.3 Contribution of W1/W2 Funds

In 2017, W1/W2 funds will be critical for initiating the food system assessments in the four focus countries. Funds will be used to convene national partners and to initiate research activities in the countries, particularly through local PhD students and postdocs. Research activities will focus on analysis of diet transition and food transformation in the four focus countries (outcome 1.1); developing, adapting, and testing methods for evaluating agri-food innovations with private sector in collaboration with AFS-CRPs (outcome 2.1); and food system upscaling with national actors (outcome 1.3).

B.1 Delivery in Flagship 2 – Biofortification

B.1.1 Expected Annual Milestones towards Outcomes 2022 [3]
As described in its impact pathway, FP2 will contribute directly to SRF outcomes through both a value chain sub-pathway and a policy sub-pathway. It will also contribute indirectly by supporting CGIAR centers and partners to mainstream nutrition in their crop breeding work. Progress towards mainstreaming nutrition will be reflected in the work plans that five CGIAR centers develop to operationalize their 2014 commitment to mainstreaming (Milestone 1 for Outcome 2.2). Progress along the value chain sub-pathway will be measured in 2017 through: the release of second-wave varieties of tier 1 crops in all eight HarvestPlus target countries (Milestone 1 for Outcome 2.1 in Table 3); adoption and consumption of biofortified crops (Milestone 1 for Outcome 2.3) and the use by country programs of monitoring, evaluation and impact evidence to refine delivery strategies (Milestones 1-3 of Outcome 2.4). Achievements of milestones will be documented by HarvestPlus in-country Monitoring, Learning and Action (MLA) teams. Progress along the policy sub-pathway will be documented by partners' use of the updated BPI to inform investment decisions and by the incorporation of biofortification into at least two global, national or regional strategies (Milestones 1-2 for Outcome 2.5). To achieve this, FP2 will work through the Comprehensive Africa Agriculture Development Programme (CAADP) and the Scaling up Nutrition Movement (SUN), as well as other collaborative bodies, in coordination with CoA 4.3 Capacity, Collaboration, Convening (3C). FP2 will also engage in developing biofortification standards and regulations through formal global normative, regulatory, and donor agencies and global technical, scientific, and implementing agencies, including Codex Alimentarius and national agriculture investment plans of several countries.

B.1.2 Output towards Outcomes 2022
Biofortified varieties. Second and third waves of high-yielding, climate-sensitive biofortified germplasm with higher nutrient content will continue to be developed in CGIAR centers and the germplasm transferred to National Agricultural Research Systems (NARS) for further development and adaptation and ultimately, for release. In 2017, crop development activities will focus on tier 1 biofortified staple crops (wheat, rice, maize, bean, cassava, and pearl millet), with some investment in secondary staples (banana/plantain, cowpea, lentil, potato, and sorghum).

Cost effective tools and techniques for mainstreaming nutrition in breeding. To support mainstreaming, FP2 will develop cost-saving breeding methods, such as marker-assisted selection (identifying specific genes associated with high mineral and vitamin content) and improved low-cost, high-throughput methods for measuring the mineral and vitamin content in seeds (in collaboration with universities in Australia, Europe, and North America).

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[3] Key outputs (in italics) for each flagship are based on the flagship impact pathway as portrayed in the A4NH Full Proposal. Our annual milestones track progress towards our 2022 outcomes, which map to a set of sub-IDOs that have not changed from PIM Table C in the full proposal. We base the indicators for the full set of sub-IDOs of which A4NH will contribute to in Phase II (Table 2) largely upon the annual milestones. Please note that this table largely ignores cross-flagship collaboration because it is organized by flagship and we want to avoid repetition, so that is why some indicator and target columns are empty.

Evidence on nutritional efficacy and impact. In 2017, FP2 will conduct an efficacy trial for zinc rice in Bangladesh, update *ex ante* impact and cost-effectiveness assessment, and expand *ex ante* impact and cost-effectiveness analysis to include multi-crop approaches. In addition, FP2 will complete two impact assessment studies in target countries and implement at least two effectiveness studies (iron beans, Guatemala; zinc wheat, Pakistan).

Delivery in target countries and lessons learned. Two main activities for 2017 will be to (i) combine short-term monitoring with medium-term progress indicators to track adoption by farmers, as well as to estimate consumption and public health impacts and (ii) assess scalability of biofortification through direct intervention in target countries, developing lessons learned about delivery modalities, consumer acceptance, and private sector engagement. An expected deliverable will be a report describing factors that drive farmer and consumer acceptance and behavior change, including differences by age, gender, and other relevant social variables.

New delivery partnerships formed and supported through technical assistance. In 2017, FP2 will identify and develop tools to help partners implement and evaluate biofortification projects, including biofortification priority indices at the subnational level

Policy analysis and engagement: Expected 2017 deliverables will include a synthesis of knowledge and lessons learned in HarvestPlus Latin America and Caribbean (LAC) countries; a definition for biofortification within the Codex Alimentarius; standards, guidelines, and recommendations developed by international bodies to inform national policies; and a side event on biofortification at the World Health Assembly.

B.1.3 Contribution of W1/W2 Funds

W1/W2 funds will be used for research to support decisions on efficacy, cost-effectiveness, targeting, delivery and enabling of large-scale impacts of biofortification. These research, monitoring and knowledge management activities support outcome 2.4. Supported activities include: (i) development of *ex ante* models to evaluate the cost-effectiveness and nutrition impact of biofortification (and relative to competing options - fortification and supplementation); (ii) building up the evidence on the nutrition impact of biofortified crops on target populations (children under 5, adolescent girls and women of child bearing age) and acceptability/adoption by target consumers and farmers through efficacy, consumer acceptance, effectiveness and impact assessment studies; (iii) development of forecasting/projection models to estimate the impact of each country program based on these data; (iv) adaptation of the monitoring system to collect reliable data on program implementation outputs, outcomes and costs; and (v) development of a knowledge management system to harness and analyze implicit, explicit and tacit knowledge (lessons learnt) from country programs, and sharing of these lessons with appropriate audiences through various media.

B.1 Delivery in Flagship 3 – Food Safety

B.1.1 Expected Annual Milestones towards Outcomes 2022
As described in its impact pathway, FP3 will contribute directly to SRF outcomes through both a policy and two separate value chains sub-pathways, one focused on improving food safety in informal markets for perishables and one on mitigating aflatoxin exposure in markets for staple grains. Progress along the policy sub-pathway in 2017 will be demonstrated by the number of countries and/or regional organizations using results of A4NH food safety research (Milestone 1 for Outcome 3.1 in Table 3). Achievement of the milestones will be verified through review of official policy documents, statements, and implementation of regulations and guidelines. Progress along the perishables value chain sub-pathway will be shown by the identification, in collaboration with other CRPs, of additional value chains for animal source foods and/or fresh produce where promising incentive- and market-based approaches can be scaled up and out (Milestone 1 for Outcome 3.2). For the aflatoxin value chain sub-pathway, delivery, communication, and policy engagement strategies with 10 partners will contribute to reaching the targets for biocontrol use in eight countries in Africa south of the Sahara (Milestone 1 for Outcome 3.3).[4] Country-level aflasafe production logs and monitoring systems, agreed upon by a multi-institutional advisory board, will be used to document the achievement of 2017 targets.

B.1.2 Output towards Outcomes 2022
Better evidence on foodborne disease. Deliverables in 2017 will include findings from a number of hazard prevalence studies on food and feed in several African countries and in Vietnam, final results from the RCT on aflatoxin and child stunting in Kenya, studies on interventions to foster behavioral change and food safety, exploration of linkages between food safety and healthy food environments, a review and synthesis on links between livestock and health and nutrition in the first 1,000 days and a series of papers on leveraging livestock value chains for health and nutrition.

Technological and institutional innovations for mitigating food safety risks designed and tested and capacity built as well *as Policy engagement to build awareness of opportunities in informal markets*. The majority of the 2017 deliverables will come from research on food safety of dairy value chains in Kenya, including formative research; training materials for value chain actors; and a communication strategy for policy makers, the media, and consumers. A second stream of deliverables in 2017 will be on ground-truthing a food safety performance assessment tool in three countries and refining a framework for assessing food safety interventions that can be applied in other CRP value chains.

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[4] Key outputs (in italics) for each flagship are based on the flagship impact pathway as portrayed in the A4NH Full Proposal. Our annual milestones track progress towards our 2022 outcomes, which map to a set of sub-IDOs that have not changed from PIM Table C in the full proposal. We base the indicators for the full set of sub-IDOs of which A4NH will contribute to in Phase II (Table 2) largely upon the annual milestones. Please note that this table largely ignores cross-flagship collaboration because it is organized by flagship and we want to avoid repetition, so that is why some indicator and target columns are empty.

Technological and institutional innovations for mitigating food safety risks related to aflatoxins designed and tested, including capacity building as well *as Policy engagement to build awareness of opportunities for mitigating and controlling aflatoxins in informal markets*. Primary activities in 2017 will be on comparing and promoting different models for aflasafe delivery in Africa, which includes working with partners from the public and private sector to develop strategy documents for aflasafe commercialization, dossiers to help move forward the registration process with regulatory bodies, and demonstrating the efficacy of the product. Another set of deliverables in 2017 will experiment with different awareness messages among maize farmers in Kenya, market-driven approaches for driving adoption of aflasafe and other post-harvest practices, and willingness to pay studies on aflatoxin safe maize in Kenya and Nigeria.

B.1.3 Contribution of W1/W2 Funds

For outcome 3.1, W1/W2 funds will support the generation and synthesis of evidence for engagement with decision makers, on topics such as the role of food safety in food systems and nutrition outcomes, leveraging livestock value chains for nutrition and health, the impact of aflatoxin information on the behavior of value chain actors (consumers and traders), and prevalence of mycotoxins in groundnuts and maize. For outcome 3.2, W1/W2 funds will support new research on market-based solutions for food safety at scale and bringing together evidence for engagement with policy makers in three livestock value chains (with Livestock – dairy in Kenya and Tanzania, pork in Uganda and shoats in Ethiopia). For outcome 3.3, W1/W2 funds will focus on augmenting available technical research funding with understanding institutional arrangements, innovative finance and other innovations for scaling control efforts. This will particularly support socio-economic research in collaboration with Wageningen University and Research Centre.

B.1 Delivery for Flagship 4 – Supporting Policies, Programs, and Enabling Action through Research

B.1.1 Expected Annual Milestones towards Outcomes 2022
As described in its impact pathway, FP4 will contribute to SRF outcomes through program and policy sub-pathways. FP4 will also contribute indirectly through its convening role linking CGIAR to nutrition and health communities in priority countries. Progress along the program sub-pathway will be measured by the number of proposals developed in collaboration with program implementers, relying on A4NH results on (gendered) impacts and cost-effectiveness in nutrition-sensitive agricultural programs (Milestone 1 for Outcome 4.2 in Table 3). FP4 researchers will work alongside program staff and other evaluators to achieve and document this milestone. Along the policy sub-pathway, as part of understanding how investors and policymakers use evidence in nutrition-sensitive programs and policies, FP4 researchers will collaborate with the SUN Secretariat and other stakeholders to map and analyze nutrition-sensitive discourse and context in regional and global organizations through a review of priority-setting approaches for nutrition; three researchable challenges for SUN policy support will be identified in 2017 (Milestone 1 for Outcome 4.3). Findings from novel methods, like *Stories of Change*, will be used to engage with key stakeholders in seven countries (Milestone 1 for Outcome 4.4). As part of its convening role, FP4 will support targeted engagement activities in 2017 in its focal countries with SUN and CAADP to identify three key capacity gaps that will shape the FP4 capacity strengthening agenda (Milestone 1 for Outcome 4.5). Achievement of these milestones will be verified through official policy statements and document review plus partner reports and program documentation.[5]

B.1.2 Outputs towards Outcomes 2022
Stronger evidence on impacts of nutrition-sensitive agricultural programs, policies, and policy processes including better understanding of pathways of impact and synergies. Major activities and deliverables in 2017 will include the comprehensive synthesis of evidence from the evaluation of nutrition-sensitive programs conducted under A4NH in Phase I (and relevant work conducted outside A4NH) and generation and dissemination of new evidence on the effectiveness, pathways of impact, and cost of innovative nutrition-sensitive programs. Another set of activities will include the initiation of *Stories of Change* case studies in two more countries and two Indian states, further work to understand the emerging nutrition transition in Zambia, and nutrition and agriculture interactions in Bangladesh and Ethiopia. Other expected deliverables include a synthesis of work conducted under a major W3/bilateral grant, *Transform Nutrition*; findings from an assessment of nutrition leadership capacity gaps, conducted with the African Nutrition Leadership Program (ANLP); and in collaboration with the International Fund for Agricultural Development (IFAD), 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.

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[5] Key outputs (in italics) for each flagship are based on the flagship impact pathway as portrayed in the A4NH Full Proposal. Our annual milestones track progress towards our 2022 outcomes, which map to a set of sub-IDOs that have not changed from PIM Table C in the full proposal. We base the indicators for the full set of sub-IDOs of which A4NH will contribute to in Phase II (Table 2) largely upon the annual milestones. Please note that this table largely ignores cross-flagship collaboration because it is organized by flagship and we want to avoid repetition, so that is why some indicator and target columns are empty.

Tools and methods to assess and deliver impact of nutrition-sensitive agricultural programs, policies, and policy processes. The creation and phased launch of a pro-WEAI resource center to make the newly developed survey instruments and code available to project designers, implementers, and evaluators will be a key achievement this year. Alongside this we will work with partner projects to use the tools. Other major activities this year will include studies assessing new platforms for delivery of nutrition-sensitive services; formative research and stakeholder consultation in preparation for pilots of two sets of tools designed to create and/or measure subnational commitment and accountability; and development of demonstration analyses for capacity strengthening activities to facilitate use of household consumption and expenditure survey (HCES) data for decision making in at least two focal countries. Activities will build on existing work and involve research demand and uptake work with major stakeholders including the Government of Tanzania, New Partnership for Africa's Development (NEPAD) and the Government of Odisha (India), as well as civil society actors in Tanzania and Odisha. A review will be undertaken of tools, methods and approaches for nutrition-relevant priority-setting in cross-sectoral (including agricultural) policy-related decision making processes, and a cross-country dataset linking food prices with nutrition outcomes will be constructed.

Enhanced capacity, leadership and engagement with key stakeholders in the design, implementation, and evaluation of nutrition-sensitive agricultural programs, policies, and policy processes. FP4 researchers will continue work with the World Food Programme (WFP) across multiple countries to increase their capacity to design and implement nutrition-sensitive programs. Other major activities in 2017 will include stakeholder engagement to begin to identify key roadblocks, barriers and challenges to be addressed by FP4's policy and implementation research. POSHAN (Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India), a major W3/bilateral grant, will undertake its annual learning conference with Indian stakeholders and the Transforming Nutrition short course will train an additional 20 or more nutrition leaders and link them to a growing leadership network. Another stream of activities will include continued engagement with CAADP, ReSAKSS and SUN processes on improving the nutrition sensitivity of existing agricultural policies, programs and regional frameworks. Deliverables will include reports on specific processes and platforms in which A4NH will have participated, which will be shared widely within CGIAR and nutrition communities of practice to increase engagement with agriculture-to-nutrition linkages related to these important national and regional level platforms. FP4 will partner with the ANLP for their 2017 annual training designed to strengthen capacity of nutrition professionals from across Africa in the generation and use of evidence for policy and programs related to agriculture and nutrition.

B.1.3 Contribution of W1/W2 Funds

For Outcomes 4.1 and 4.2, the individual impact evaluations of nutrition-sensitive agricultural programs are funded by W3/bilateral grants; W1/W2 funds are used for synthesis. For Outcomes 4.3 and 4.4, W1/W2 funds are used for review and synthesis of findings from W3/bilateral grants, for testing new methods with partners, and for integrating gender. For Outcome 4.5, W1/W2 funds are used for work on leadership gaps, complementing work on capacity gaps funded by W3/bilateral grants, and on A4NH's convening role on behalf of CGIAR with respect to multilateral organizations and nutrition-health communities in focus countries.

B.1 Delivery for Flagship 5 – Improving Human Health

B.1.1 Expected Annual Milestones towards Outcomes 2022
As described in its impact pathway, FP5 will contribute directly to SRF outcomes through program and policy sub-pathways. It will also contribute indirectly by linking CGIAR researchers to the public health research community. Most of the 2017 milestones relate to building and operationalizing research partnerships, such as identifying and launching collaborative studies to compare geospatial changes in agriculture and vector-borne disease in Africa and to integrate mosquito monitoring into rice data collection (Milestones 1 and 2 for Outcome 5.1 in Table 3). FP5 evidence and research activities will lead to successful marketing of a serum and DNA bank to regional research communities, inclusion of cysticercosis control targeting livestock in a national-level neglected tropical disease control agenda, and changes in other disease control policies at sub-national and national levels (Milestones 1-3 for Outcome 5.2). Progress along the policy sub-pathway will be documented by showing that national-level decision makers are aware of antimicrobial drug use patterns in livestock keeping systems and the impact on resistance and through the participation of at least 10 research organizations representing the natural and social sciences in theme-based workshops shaping the FP5 agenda and 2018 agriculture and public health conference (Milestones 1 and 2 for Outcome 5.3).[6] Workshop reports, annual reporting from partners, and content analysis of official statements and documents will be used to document achievement of this milestone.

B.1.2 Outputs towards Outcomes 2022
Mapping and analysis of changing agro-ecosystems and health outcomes as well as *Evidence base on impacts of agriculture and health issues and interventions.* In 2017, collaborations will be established and analysis will begin on the relationships between geospatial patterns of agricultural change and vector-borne disease transmission and risks maps for climate-sensitive diseases. By year's end, other areas for further research will have been identified. Data collection methods and protocols will be developed in 1-2 settings on perspectives of farmers and residents on the side effects of farming on environmental health (including mosquitoes and vector-borne diseases) and measures of mosquito productivity integrated into rice-growth monitoring in a rice research setting. Farmer field school (FFS) curricula will be updated with training modules on the use of minimal tillage, intermittent flooding and proper soil leveling for reduced *Anopheles* development in target rice fields and analysis of constraints associated with rice farming (irrigation, tillage, leveling) will be completed.

Evidence base on the benefits of joint agriculture and health interventions against zoonotic disease as well as *Portfolio of validated methods for alternative surveillance and control options of animal and human disease.* In 2017, FP will continue ongoing studies on zoonoses including

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[6] Key outputs (in italics) for each flagship are based on the flagship impact pathway as portrayed in the A4NH Full Proposal. Our annual milestones track progress towards our 2022 outcomes, which map to a set of sub-IDOs that have not changed from [PIM Table C](#) in the full proposal. We base the indicators for the full set of sub-IDOs of which A4NH will contribute to in Phase II (Table 2) largely upon the annual milestones. Please note that this table largely ignores cross-flagship collaboration because it is organized by flagship and we want to avoid repetition, so that is why some indicator and target columns are empty.

quantified disease risk from zoonoses in a range of agricultural systems and landscape genetic studies of pathogen diversity in complex consumer driven agricultural systems in Africa. In 2017, a collection of methods and tools for cysticercosis surveillance and control will be completed and disseminated in East Africa, including a gold standard serum bank. High-level policy documents will be designed to assist national governments with targeted health policy interventions. One of the major deliverables will be the development of an electronic surveillance system for zoonotic diseases as part of a research for development partnership between ILRI, the University of Liverpool and the national and devolved county governments of Kenya. This will contribute towards surveillance for emerging pathogens and a range of zoonotic diseases.

Evidence base on impacts of agriculture and health issues and interventions as well as *Better understanding and awareness of agriculture and health issues and stronger working relationships and commitments from the agriculture and health communities*. Field studies will launch in 2017 to examine animal antimicrobial drug prescribing practices in both smallholder livestock systems and key representatives of the intensive farm sector, assess patterns of resistance in isolates from actors in the animal source food system, and analyze patterns of AMR phenotype and genotype distribution between animals, humans and the physical environment in several countries in Africa and Vietnam in Asia. Interdisciplinary workshops between animal and human health experts on market chains and drug-seeking behavior will build public health and agricultural collaboration around AMR. A second stream of work will include launching studies on resistance selection in *Anopheles* in cocoa-farming and insecticide-treated net (ITN) areas. Other key activities will relate to preparation for the first Agriculture and Public Health Conference (AGRAPH) in 2018. Bringing together leaders in this space will be an important step in designing future engagements and initiatives between CGIAR and public health. A series of consultations will be held in 2017, building on the 2015 workshops convened by A4NH.

B.1.3 Contribution of W1/W2 Funds

At FP level, W1/W2 funds will be used to facilitate engagement of agriculture and public health researchers leading to the development of joint research. Formative research will be supported to provide evidence for subsequent proposals (outcome 5.1). Efforts toward outcomes 5.2 and 5.3, will take a mixed approach: some larger bilateral grants with ongoing field infrastructure and data generating capacity will be supported to re-orient data collection for research to provide evidence and engage partners for larger scale efforts for controlling zoonoses and for formative research on human AMR from livestock systems.

Flagship level tables consolidated

Table 2: Expected contributions to CGIAR's sub-IDOs[7, 8]

FP No.	Mapped and contributing to Sub-IDO	Relevant CRP sub-IDO indicators*	2017 Target
FP1	1.3.1		
	2.1.1	Number of value chain actors using evaluation findings to inform operational and investment decisions in food systems for healthier diets	*None in 2017. Targets set appear in subsequent years.*
	2.1.2		
	2.1.3		
	CC 2.1.3		
	CC 3.1.3		
	CC 4.1.1		
	CC 4.1.3	Number of research organizations across the 4 focus countries applying validated metrics and tools for assessing diet quality and characterizing food systems	*None in 2017. Targets set appear in subsequent years.*
FP2	1.4.2	Number of households growing biofortified varieties	6.5 million
	2.1.1		
	2.1.2	Number of individuals consuming biofortified crops	32.5 million
	CC 2.1.3		
	CC 3.1.2		
	CC 3.1.3	Number of countries and/or regional organizations engaging in and being influenced by A4NH research on nutrition-sensitive agricultural policy	2
	CC 4.1.1		
FP3	1.2.2	Number of traders in Kenya, Tanzania, Uganda, and Vietnam benefitting from training & certification scheme	*None in 2017. Targets set appear in subsequent years.*

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[7] Our annual milestones track progress towards our 2022 outcomes, which map to a set of sub-IDOs that have not changed from PIM Table C in the full proposal. We base the indicators for the full set of sub-IDOs of which A4NH will contribute to in Phase II (Table 2) largely upon the annual milestones. Please note that this table largely ignores cross-flagship collaboration because it is organized by flagship and we want to avoid repetition, so that is why some indicator and target columns are empty.

[8] The five A4NH Phase II focus countries are: Bangladesh, Ethiopia, India, Nigeria, and Vietnam. The four FP1 focus countries are: Bangladesh, Ethiopia, Nigeria, and Vietnam. The nine HarvestPlus target countries in FP2 are: Bangladesh, Democratic Republic of Congo, India, Nigeria, Pakistan, Rwanda, Uganda, and Zambia. The seven focal countries for FP4 are: Bangladesh, Ethiopia, India (state level), Nepal, Tanzania, Vietnam, and Zambia.

	2.2.1	Number of farmers adopting Good Agricultural Practices and/or biocontrol to mitigate aflatoxin contamination	39,000
		Number of public sector agencies and/or private agribusinesses adopting gender-sensitive Good Agricultural Practices and/or biocontrol to reduce aflatoxin contamination in crop value chains	*None in 2017. Targets set appear in subsequent years.*
	2.2.2	Number of countries and/or regional organizations using results of A4NH food safety research in design of monitoring systems, policies, and regulations that take into account equity and risks	6
	CC 2.1.1		
	CC 3.1.1	Numbers of millers with capacity to monitor the safety of food supplied to non-farm maize meal consumers in Africa	*None in 2017. Targets set appear in subsequent years.*
	CC 4.1.1		
	CC 4.1.2		
FP4	1.3.2		
	2.1.1		
	2.1.2		
	2.1.3	Number of development organizations using A4NH results on (gendered) impacts and cost-effectiveness in programming of nutrition-sensitive ag programs	*2*
	CC 1.1.3		
	CC 2.1.1	Number of organizations implementing agricultural projects with women's empowerment objectives and using pro-WEAI to monitor impacts	*None in 2017. Targets set appear in subsequent years.*
	CC 2.1.3		
	CC 3.1.1		
	CC 3.1.2	Number of partner organizations with increased capacity in nutrition sensitive agriculture programming and policy	*None in 2017. Targets set appear in subsequent years.*
	CC 3.1.3	Number of countries and/or regional organizations engaging in and/or being influenced by A4NH research on nutrition sensitive agricultural policy	7
	CC 4.1.1	Number of research partners with increased institutional capacity to conduct integrated ANH research	5
	CC 4.1.2	Number of individuals with increased capacity to conduct integrated ANH research	*None in 2017. Targets set appear in subsequent years.*
	CC 4.1.3		
	CC 4.1.4		

FP5	2.3.2	Number of stakeholders with access to a validated and semi-commercialized pen-side diagnostic assay for cysticercosis	*None in 2017. Targets set appear in subsequent years.*
		Number of research partners influenced by A4NH research on agricultural intensification and links to human health	17
		Number of national, regional, or global bodies using A4NH evidence to inform policy processes, guidelines, and program implementation related to zoonoses prevention and control in livestock communities	*None in 2017. Targets set appear in subsequent years.*
	2.3.3	Number of policy makers and decisionmakers aware of and using A4NH research on the livestock sector's contribution to antimicrobial resistance	15
	3.3.1	Number of communities where farmers are using methods developed through participatory research which reduce vector risk	*None in 2017. Targets set appear in subsequent years.*
		Number of national agricultural research authorities issuing recommendations promoting agricultural production methods which reduce vector risk	*None in 2017. Targets set appear in subsequent years.*
	3.3.2		
	CC 2.1.3		
	CC 3.1.4		
	CC 4.1.1		
	CC 4.1.2		

Table 3: Expected Annual Milestones (progress markers) towards Outcomes 2022[9]

FP No.	FP Outcome 2022	Milestone 2017	Mapped budget request for 2017 (in millions)	
			W1/ W2 USD	W3/ bilateral USD
FP1	Outcome 1.1 Partners and other CRPs incorporate nutrition, health and gender in agri-food value chains and food systems programs	None for 2017	$ 1.70	$ 5.17
	Outcome 1.2 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 Vietnam	$ 1.30	$ 4.32
	Outcome 1.3 Public-private partnerships formed to promote implementation of A4NH strategies for agri-food value chain/food system innovations and interventions at scale	None for 2017	$ 0.80	$ 1.75
FP2	Outcome 2.1 High-yielding micronutrient enhanced varieties developed and released in target and expansion countries	All 8 target countries release second-wave of tier 1 crops	$ 0.00	$ 6.50
	Outcome 2.2 Biofortification mainstreamed into CGIAR and NARS breeding efforts	5 CGIAR centers develop a work plan and strategy in collaboration with HarvestPlus to operationalize 2014 commitment to mainstreaming	$ 0.00	$ 5.50

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[9] The five A4NH Phase II focus countries are: Bangladesh, Ethiopia, India, Nigeria, and Vietnam. The four FP1 focus countries are: Bangladesh, Ethiopia, Nigeria, and Vietnam. The nine HarvestPlus target countries in FP2 are: Bangladesh, Democratic Republic of Congo, India, Nigeria, Pakistan, Rwanda, Uganda, and Zambia. The seven focal countries for FP4 are: Bangladesh, Ethiopia, India (state level), Nepal, Tanzania, Vietnam, and Zambia.

	Outcome 2.3 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)	$ 0.00	$ 12.00
	Outcome 2.4 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	$ 3.50	$ 2.00
		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		
	Outcome 2.5 Biofortification supported by global institutions and incorporated into plans and policies by stakeholders	The revised biofortification priority index (BPI 2.0) is are available to partners for informing decisions on investing in implementing and evaluating biofortification projects	$ 0.00	$ 4.00
		Biofortification is included in at least two additional global, regional or national strategies and/or policies		
FP3	Outcome 3.1 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 (Vietnam + TBD) engaged in review process on food safety in informal markets (which includes gender and equity aspects)	$ 0.50	$ 0.80
	Outcome 3.2 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	$ 1.30	$ 2.20
	Outcome 3.3 Biocontrol and GAP delivered at scale in key countries along	39,000 farmers use biocontrol across 8 countries in Sub Saharan Africa	$ 1.70	$ 5.80

	with understanding of their impact and appropriate use			
FP4	Outcome 4.1 Development program implementers and investors (governments, NGOs, UN institutions) use evidence, tools and methods to design and implement cost-effective nutrition-sensitive agricultural programs at scale	None in 2017	$ 0.90	$ 4.90
	Outcome 4.2 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 programme partner (WFP) in 2017), each with a rigorous evaluation component included	$ 1.00	$ 5.00
	Outcome 4.3 Regional, international and UN agencies and initiatives and investors use evidence, tools and methods to inform decisions and investment strategies to guide and support nutrition-sensitive agricultural programming and nutrition-sensitive policies	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	$ 0.60	$1.30
	Outcome 4.4 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, Vietnam, and Zambia	$ 0.60	$ 1.20
	Outcome 4.5 Stakeholders from different sectors, governments, UN institutions, civil society and	3 key capacity gaps identified through engagement with key partners from SUN, CAADP, and others in identified pathways at national, regional, international and	$ 0.70	$ 2.10

	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.	subnational levels and cross-CRP to guide flagship capacity strengthening agenda and shape regional events in 2018		
FP5	Outcome 5.1 Agricultural research initiatives, including farming communities, measure health risks and benefits	Key areas of potential research collaboration identified and project underway to compare geospatial changes in agriculture and vector borne disease in Africa	$ 0.70	$ 0.10
		Rice researchers demonstrate interest in measuring mosquito productivity as well as rice productivity and collaborations established to integrate mosquito monitoring into rice data collection		
	Outcome 5.2 Agricultural and public health policymakers and implementers deliver coordinated and effective solutions to cysticercosis and other zoonotic threats	Serum and DNA bank marketed to the regional research community	$ 0.60	$ 0.99
		Inclusion of cysticercosis control targeting livestock in the neglected tropical disease control agenda at national scale		
		Policy documents supported by peer reviewed publications that have a demonstrable change on disease control policy at national or sub-national scale.		
	Outcome 5.3 Public and private sector policymakers implement measures to reduce health risks from antimicrobial resistance in hotspot livestock systems	15 national level decision makers made aware of antimicrobial drug use patterns in livestock keeping systems and the impact on resistance	$ 0.50	$ 0.10
		At least 10 research organizations representing natural and social scientists from health and agriculture participate in theme-based workshops which recognize gender and equity issues, and build on partnerships identified in 2015 A4NH regional consultations		

Table 4: Expected Key Outputs 2017 towards Outcomes 2022[10]

Note: Key outputs are in bold and expected 2017 deliverables are summarized below.

FP No.	FP Outcome	Key Output	Tagging of expected outputs 2017		
			G	Y	CD
FP1	Outcome 1.1	**Methods, metrics and tools for assessing and analyzing diet-food system linkages** Articles, reports, and other publications on: • Conceptual framework for food system analysis from nutrition and sustainability perspectives • Metrics, including (i) global GDP-dependent metric for quantifying food waste in caloric terms, at the level of end-consumers, for use in scenario analysis and (ii) agro diversity metrics for food system components (production, markets, consumers' plates) across different settings, for integration in spatial and climate modelling • Tools, including (i) revised cost of diet tool to assess cost of nutritious diets with and without an intervention (used in Kenya) and (ii) innovative tools to monitor dietary intake in Kenya, Malawi and Zambia • Data inventory and strategy for (i) carrying out food system analysis from a nutrition perspective in Ethiopia and Vietnam and (ii) working with CGIAR Big Data Platform on food system data linkages for Vietnam	1	1	1
		Key leverage points identified for improving diets through food systems Articles, reports, and other publications on: • Methods to identify key entry points for participatory appraisal of wet market actors to identify key leverage points for nutrition improvement in Vietnam • Diagnosis (mapping) of food systems' sustainability and drivers as part of the development and implementation of a foresight/scenario analysis at the global level • Food system analysis to identify key leverage points for healthier diets for targeted vulnerable populations in Ethiopia, Kenya, Uganda, and Vietnam • Research proposal for incorporating nutrition variables in modelling and foresight analysis	2	1	0
	Outcome 1.2	**Evidence base on the effectiveness and impacts of food systems interventions** Articles, reports, and other publications on:	1	0	1

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[10] The five A4NH Phase II focus countries are: Bangladesh, Ethiopia, India, Nigeria, and Vietnam. The four FP1 focus countries are: Bangladesh, Ethiopia, Nigeria, and Vietnam. The nine HarvestPlus target countries in FP2 are: Bangladesh, Democratic Republic of Congo, India, Nigeria, Pakistan, Rwanda, Uganda, and Zambia. The seven focal countries for FP4 are: Bangladesh, Ethiopia, India (state level), Nepal, Tanzania, Vietnam, and Zambia.

		• Baseline studies on (i) production, consumption and processing of nutritious foods (beans, DGLV, fish) in Zambia and Malawi, (ii) intake of local nutrient dense foods (fruits, vegetables, legumes) in vulnerable populations in Zambia, (iii) fruit and vegetable intake of rural hub consumers in South Africa, all as part of the design of different food system interventions carried out in subsequent years • Methodology for (i) evaluating impact of innovations towards healthier diets using a food system perspective and (ii) identifying key entry points for gender and nutrition sensitive upgrading and use of underutilized species for better nutrition in Mali, India and Guatemala • Importance of agro-biodiversity for nutrition • Implementation of (i) lab-in-the field experiments to improve diets through a food (mung bean) and an income (jute) pathway relating producers to input dealers (value chain/market approach) in Bangladesh, (ii) impact evaluation of demand site intervention (stimulation of vegetable choice consumption) in Nigeria, and (iii) analysis of at least five sets of business models to assess degree of inclusiveness and existence of nutrition objectives as key propositions in current business models in Kenya and Uganda Identification and/or design of interventions on (i) supply-side food system innovation in Bangladesh, Ethiopia and Vietnam including identification of main private sector partner; (ii) demand-side innovation in Ethiopia; and (iii) production, consumption and marketing of traditional leafy vegetables in Western Kenya			
	Outcome 1.3	**Policy process analysis and policy engagement** Engagement activities plus other publications prepared on: • Policy baseline analysis of food system-related policy context in Vietnam and Ethiopia • Participatory scenario analysis of food system transformation in Vietnam • Systematic review of current knowledge, understanding and frameworks applied to food system policies for healthier diets Three research proposals on (i) power of consumers to transform food systems; (ii) participatory food systems governance methodology; (iii) toolbox strategies and instruments for food systems policies for healthier diets	1	0	1
		Awareness and capacity among key partners and stakeholders, including other CRPs, about diet-food system linkages • National and international policy guidelines and recommendations that promote the mainstreaming of agricultural biodiversity conservation and sustainable use for food and nutrition, health and education • Development strategy for the new platform for healthy diets • Capacity building efforts with (i) local MSc student projects and theses on analyzing linkages between agrobiodiversity-diets-nutrition and (ii) local partners (in Guatemala,	1	0	2

		India, and Mali) on nutrition and gender sensitive methodologies for value chain development of underutilized species			
FP2	Outcome 2.1	**Biofortified varieties** • Second and third waves of high-yielding, biofortified germplasm with higher nutrient content developed and distributed to NARS (women's and children's preferences considered in breeding process)	1	1	1
	Outcome 2.2	**Cost effective tools and techniques for mainstreaming nutrition in breeding** • Cost-saving strategy for breeding methods	0	0	1
	Outcome 2.3	**Delivery in target countries** • Planting material delivered to farmers in target countries	1	1	1
	Outcome 2.4	**Evidence on nutritional efficacy and program cost-effectiveness** Articles, reports, and other publications on: • Updated *ex ante* impact and cost-effectiveness analyses of all target micronutrient-crop-country combinations • Baseline socio-economic, nutrition and intervention implementation for the iron bean effectiveness study in Guatemala • Impact assessments of iron bean delivery interventions in Rwanda, and vitamin A maize delivery interventions in Zambia • Consumer acceptance data, with gender lens, on acceptability of iron and vitamin A crops and on one zinc crop • Study protocols and data collection instruments for (i) efficacy trials for zinc rice in Bangladesh and (ii) assessment studies for vitamin A cassava delivery interventions in Nigeria and zinc rice delivery interventions in Bangladesh • Monitoring and forecasting models for all target countries • Knowledge management system developed and implemented	1	1	0
	Outcome 2.5	**New delivery partnerships formed and supported through technical assistance** • BPI 2.0 (online tool) published and promoted through various channels	0	0	1
		Policy analysis and engagement Engagement activities plus articles, reports and other publications prepared for: • Codex Regional Coordinating Committees to foster global and national policy and regulatory support for biofortification and, more specifically, to advance biofortification definition to Step 5 in the Codex Step process • eWGs of Codex Committees on Food Safety and Nutrition, in conjunction with FP3 • 3rd Global Conference on Biofortification (in 2018)	0	0	1
FP3	Outcome 3.1	**Better evidence on foodborne disease in target regions** Articles, reports, and other publications on:	1	0	0

		• Food safety issues in poor and low income countries, including (i) strategies for leveraging livestock value chains for nutrition and health and (ii) indirect effects of food safety on nutrition • Food safety metrics and methods for nutrition, health, and production • Hazards and risks in livestock value chains and agro-ecosystems • Aflatoxin prevalence studies in food and feed in several African nations (Burundi, DRC, Senegal, Zambia), and Vietnam, and comparisons of aflatoxin in formal and informal sector maize and aflatoxin in maize used for different purposes • Impacts of (i) standards on aflatoxin risk and economic burden of aflatoxin in Kenya and (ii) aflatoxin information on behavior of value chain actors • Final results from the RCT on aflatoxin and child stunting in Kenya			
	Outcome 3.2	**Technological and institutional innovations for mitigating food safety risks designed and tested and capacity built** • Tool for assessing food safety performance in 3 countries and framework for assessing food safety interventions • Communication strategy for policy makers, media, and consumers and training materials for dairy chain actors in Kenya • Publication describing formative research on dairy in Kenya	1	0	1
		Policy engagement to build awareness of opportunities in informal markets Engagement and capacity development activities plus publications prepared for/with: • (i) USAID on food safety, (ii) FAO on food safety and healthy food environments, and (iii) GLAD livestock advocacy initiative on food safety evidence base • Vietnam stakeholders on the outcomes and operational experiences of the National Taskforce and on national food safety management assessment and recommendations • National stakeholders in 3 countries on recommendations for priority food safety investments and in 4 countries on targeted messages for livestock value chain platforms • CSOs on understanding milk safety	0	0	1
	Outcome 3.3	**Technological and institutional innovations for mitigating food safety risks designed and tested and capacity built** Articles, reports, and other publications on: • Efficacy of aflasafe in Senegal, Gambia, Nigeria, Malawi, Mozambique, Tanzania • Aflasafe commercialization strategy (with private sector partners) for Nigeria, Kenya, The Gambia, and Senegal • Aflasafe registration in Burkina Faso and Ghana (dossiers prepared for regulatory authorities) • Viability of promising market-driven approach to drive adoption of biocontrol and post-harvest practices to reduce aflatoxin in maize, • Experiments and WTP studies on aflatoxin safe maize in Kenya and Nigeria • Comparison of different messages for farmer control of aflatoxin in maize in Kenya	0	0	1
		Policy engagement to build awareness of opportunities in informal markets	0	0	1

		• National communication strategy for aflasafe in Kenya • Policy briefs and related engagement on 2+ new findings relevant to Kenya and East Africa			
FP4	Outcomes 4.1 and 4.2	**Stronger evidence on impacts of nutrition-sensitive agricultural programs, policies, and policy processes including better understanding of pathways of impact and synergies** Articles, reports, and other publications on: • Comprehensive evidence matrix from A4NH Phase I • Baseline and final impact evaluation results from at least five different nutrition-sensitive programs implemented in different contexts and settings across 6 countries • Formative research and project planning for 3 further studies • Data analysis on agriculture-nutrition linkages Engagement and dissemination activities related to the above (e.g., articles, papers, policy briefs, stakeholder workshops, videos, blog posts, scientific conferences)	2	0	0
		Tools and methods to assess and deliver impact of nutrition-sensitive agricultural programs, policies, and policy processes • Pro-WEAI Resource Center established and paper on strategies for use • Datasets (quantitative and qualitative) from at least three impact evaluations of delivery of nutrition-sensitive programs in different contexts and settings compiled and made available, planning and baselines for a further 4 studies • Articles, reports and other publications describing the impact evaluations from above, including their design and results • Study design for an integrated nutrition and health services project in Nepal particularly targeting adolescents	2	1	0
		Enhanced capacity, leadership and engagement with key stakeholders in the design, implementation, and evaluation of nutrition-sensitive agricultural programs, policies, and policy processes • Workshop reports from GAAP2 lesson sharing workshop and two other events to support learning network for self-help groups in India delivering nutrition messages • At least two proposals, submitted with WFP, designed to help strengthen nutrition impacts of WFP's nutrition-sensitive programs	2	0	2
	Outcomes 4.3 and 4.4	**Stronger evidence on impacts of nutrition-sensitive agricultural programs, policies, and policy processes including better understanding of pathways of impact and synergies** Articles, reports, and other publications on: • Nutrition transition and women's empowerment in Zambia • Farming systems and diets in India and Bangladesh • Child growth, care and seasonality in India • Policy landscaping from Tanzania and Vietnam (tbc)	1	0	0

		• Enabling environments for nutrition and agriculture in South Asia • Stories of Change from two Indian states • Synthesis of findings, summaries, and events from *Transform Nutrition* and POSHAN • Cross-national analysis of agriculture-nutrition linkages			
		Tools and methods to assess and deliver impact of nutrition-sensitive agricultural programs, policies, and policy processes Articles, reports, and other publications on: • Index and tool construction, including protocols on commitment and accountability • Review of nutrition-relevant priority setting tools and methods • Cross-country dataset and analysis that links food prices with nutrition outcomes	1	0	0
		Enhanced capacity, leadership and engagement with key stakeholders in the design, implementation, and evaluation of nutrition-sensitive agricultural programs, policies, and policy processes • Draft study protocols generated through engagement with SUN network to research key challenges in implementation of SUN Roadmap • Conference reports, course outlines, and training reports from capacity building activities in India and the UK (for international participants)	1	0	2
	Outcome 4.5	**Stronger evidence on impacts of nutrition-sensitive agricultural programs, policies, and policy processes including better understanding of pathways of impact and synergies** Articles, reports, and other publications on: • Leadership capacity gaps for nutrition and for nutrition-sensitive agricultural policies and programs • Scoping reports for IFAD partnership including development of a theory of change • Role of leadership in change in nutrition in Rwanda • Planning for the future development of this new cluster	0	0	2
		Tools and methods to assess and deliver impact of nutrition-sensitive agricultural programs, policies, and policy processes • Demonstration analysis plan for using HCES data each of 2 focal countries (tbd), plus guidelines and training materials	0	0	2
		Enhanced capacity, leadership and engagement with key stakeholders in the design, implementation, and evaluation of nutrition-sensitive agricultural programs, policies, and policy processes Articles, reports, and other publications on: • Specific processes and platforms convened involving CAADP, ReSAKSS and SUN at Africa regional level and for focus countries • Convening across CRPs on nutrition-sensitivity • Joint training with ANLP • Evidence related to selected advocacy issues in up to 4 countries (Burkina Faso, Ghana, Rwanda, Indonesia)	0	0	2

FP5	Outcome 5.1	**Mapping and analysis of changing agro-ecosystems and health outcomes** • Collaboration established and analysis underway on (i) relationships between geospatial patterns of agricultural change and vector-borne disease transmission and identification of areas for further research, and (ii) risk maps for climate-sensitive diseases	0	0	1
		Evidence base on impacts of agriculture and health issues and interventions • Data collection methods and protocols developed in 1-2 settings on: (i) perspectives of farmers and residents on the side effects of farming on environmental health (including mosquitoes and vector-borne diseases), (ii) measures of mosquito productivity integrated into rice-growth monitoring in a rice research setting. • Updated farmer field school (FFS) curricula with training modules on the use of minimal tillage, intermittent flooding and proper soil leveling for reduced *Anopheles* development in target rice fields, • Analysis of constraints associated with rice farming (irrigation, tillage, leveling)	1	1	1
	Outcome 5.2	**Evidence base on the benefits of joint agriculture and health interventions against zoonotic disease** • Peer reviewed articles, reports, or other publications on (i) quantified disease risk from zoonoses in a range of agricultural systems and (ii) landscape genetic studies of pathogen diversity in complex consumer driven agricultural systems in Africa • High level policy documents designed to assist national governments with targeted health policy interventions	1	0	1
		Portfolio of validated methods for alternative surveillance and control options of animal and human disease • Electronic surveillance system for zoonotic and other livestock diseases in 3 counties in Western Kenya and Marsabit County, Kenya • Methods and tools for cysticercosis surveillance and control: (i) creation of a gold standard serum bank for East Africa, (ii) validation of a rapid diagnostic tool, (iii) and national map for Kenya of pig population density and initial national risk map for Rwanda, and (iv) Swahili translation of the *Vicious Worm* health information tool making it available to 50 million Swahili speakers • Publication on risk of cysticercosis in the food chain	1	1	1
	Outcome 5.3	**Evidence base on impacts of agriculture and health issues and interventions related to AMR and other global health challenges** • Articles, reports, and other publications on (i) identification and classification of cocoa agrochemicals and (ii) seasonal maps of *anopheles* resistance to the main insecticides used by farmers and description of mechanisms of resistance • Field studies designed to examine (i) animal antimicrobial drug prescribing practices in both smallholder livestock systems and key representatives of the intensive farm sector (in Kenya, Vietnam with Livestock); (ii) assessment of patterns of resistance in isolates from actors in the animal source food system and (iii) analysis of patterns of AMR	0	0	1

		phenotype and genotype distribution between animals, humans and the physcial environment (in Africa including one or more of Ethiopia, Kenya, Malawi, Tanzania; in Asia including Vietnam).			
		Better understanding and awareness of agriculture and health issues and stronger working relationships and commitments from the agriculture and health communities • Report on workshops to build public health and agricultural collaboration, including interdisciplinary AMR workshops between animal and human health experts on market chains and drug seeking behavior • International consultations on agriculture-health collaboration and development of a program for the first international AGRAPH Conference in 2018	1	0	1