



A4NH

2015 Annual Report



RESEARCH
PROGRAM ON
Agriculture for
Nutrition
and Health

Led by IFPRI

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In its fourth year, the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH) has many accomplishments to be proud of and much to look forward to. By the end of 2015, biofortified staple foods had reached approximately 15 million people. The aflasafe™ approach for controlling aflatoxins was registered in Kenya, Nigeria, and Senegal, with country investments secured to scale it up. The successful Together for Nutrition initiative expanded from India to Ethiopia, bringing together a range of nutrition stakeholders. The *Global Nutrition Report (GNR) 2015* was released alongside the launch of the Sustainable Development Goals, building off the success of GNR 2014 to guide nutrition action. Our research portfolio is expanding to include food systems and we are exploring new collaborations with public health partners. Our country and regional engagement contributes to agricultural programs and policies that can better achieve nutrition and health impacts. We also hear loud and clear from the development community that achieving these outcomes is a priority, and that doing so at scale requires making agriculture and other sectors more nutrition and health-sensitive.



A Message from A4NH's Director

2015 has been an exciting year. Globally, the Agenda for Sustainable Development to 2030 has placed strong emphasis on the importance of food and nutrition security, health, equity and empowerment, and country ownership and leadership—all core elements of A4NH. There are numerous follow-up actions from the second International Conference on Nutrition (ICN2) co-convened by the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) late in 2014. In December 2015, WHO released their long-awaited report on the global burden of foodborne diseases.

There were many exciting country-level initiatives. In 2015, Together for Nutrition, a successful platform launched in India in 2014, expanded with a meeting of nutrition stakeholders in Ethiopia. We officially launched Stories of Change, which systematically documents the process of improving nutrition in several countries with the highest burdens of undernutrition. We look forward to hearing and acting on these stories in 2016 and beyond.

A4NH received and adopted recommendations from two major external evaluations of our program, one on food safety research and one on the program as a whole. The evaluation teams provided us with useful lessons and insights for the future. We also developed a new partnership for food systems research and a novel cross-sectoral partnership between agriculture and public health research. Our teams have been busy pulling all these lessons learned and future opportunities together and integrating them into a full proposal (March 2016) for a second phase of A4NH, to run from 2017–2022. I am really excited to share with you—our partners, supporters, and friends—the updates, accomplishments, and new directions presented in this report.



John McDermott



A Message from IFPRI's Director General

A4NH continues to reach new research heights—this past year was no exception. The program engaged decision makers in the European Union and the African, Caribbean, and Pacific Group of States on enhancing nutrition multisectorally, and supported the compilation of lessons on improving food safety in informal value chains, material which has already been used to upgrade public health curricula at African universities. Furthermore, an efficacy study conducted by HarvestPlus in India found that iron pearl millet was able to reverse iron deficiency in school-aged children within six months.

With these and many other achievements under its belt, the program is now focused on developing its second phase (2017–2022). I have seen tremendous enthusiasm from our partners for the research activities of the program—activities that are enhancing agricultural contributions to improved nutrition and health. Research on the linkages between agriculture and nutrition are informing policies, programs, and investments with the power to vastly improve the nutrition and health of the 75 percent of the world's poor people living in rural areas and depending on agriculture for their survival.

A4NH helps fulfill the CGIAR's Strategy and Results Framework, particularly the system-level outcome on improving food and nutrition security, and contributes to realizing Sustainable Development Goal 2—to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

I am proud of the strides made by A4NH this past year, and look forward to IFPRI's continued leadership of this critical program.



Shenggen Fan



2015 HIGHLIGHTS

GLOBAL MILESTONES IN AGRICULTURE, NUTRITION, AND HEALTH



MAY

CGIAR approves a new Strategy and Results Framework (SRF) that defines the strategic actions necessary to deliver on its mission for 2016–2030.

JUNE

Kenyan government grants full registration status to the biocontrol product, Aflasafe KE01™ to fight aflatoxins.

JULY

At the 38th Session of the Codex Alimentarius Commission, Codex approves new work on biofortification and agrees on criteria for including a definition for biofortified products,

to be presented in the 2016 session of the Codex Committee on Nutrition and Foods for Special Dietary Uses.

SEPTEMBER

Nearly 200 countries adopt a set of 17 ambitious Sustainable Development Goals (SDGs) to end poverty, protect the planet, and ensure prosperity for all in 15 years, as part of a new sustainable development agenda.

By 2030, the action of CGIAR and its partners will result in **150** million fewer hungry people. —CGIAR SRF, 2015



A4NH MILESTONES

JANUARY

Participants from across CGIAR and beyond refine *Value Chains and Nutrition: A Framework to Support the Identification, Design, and Evaluation of Interventions*.

HarvestPlus launches new online Biofortification Priority Index to guide stakeholders in deciding where, and in which biofortified crops, to invest.



FEBRUARY



The United Kingdom's All-Party Parliamentary Group (APPG) hosts launch of Global Panel on Agriculture and Food Systems for Nutrition (GLOPAN)'s Biofortification Policy Brief, which presents biofortification as one element of a nutrition-sensitive national agricultural research and investment strategy.

HarvestPlus and partners publish synthesis of the nutritional efficacy research on high-iron beans, which concludes that beans are a good vehicle for iron biofortification.

APRIL

A4NH publishes results from a **study** conducted by TANGO International on the uptake and impact of research by international nongovernmental organizations working on agriculture and nutrition.

A4NH convenes three regional consultations with public health stakeholders in East Africa, West Africa, and South Asia to discuss ideas for an expansion of collaborative research on agriculture and health.

“The regional public health consultations with A4NH highlighted issues of concern, bringing together a network of professionals to brainstorm, share, and deliberate on issues that would feed into the development of a compelling agriculture and health research agenda.”

—Dr. Manish Kakkar, Senior Public Health Specialist, Public Health Foundation of India (PHFI)

MAY

A4NH and the Technical Centre for Agricultural and Rural Cooperation (CTA) **co-host a Brussels Briefing**, entitled, “Improving Nutrition through Accountability, Ownership, and Partnerships.”



A4NH and the Leverhulme Centre for Integrative Research on Agriculture and Health (LCIRAH) share findings from a systematic review on the impacts of women's time use in agriculture on nutrition.

An external evaluation of A4NH's food safety research concludes, offering new insight and recommendations for future planning.

JUNE

A4NH and LCIRAH, along with the Innovative Methods and Metrics for Agriculture and Nutrition Actions (IMMANA) initiative, launch the **Agriculture, Nutrition and Health Academy** (ANH Academy), a platform for developing future research leaders.

Transform Nutrition, IFPRI's Ethiopia Strategy Support Program and Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India (**POSHAN**) co-host a one-day conference, Together for Nutrition II, in Addis Ababa.



“It’s more than a report—it’s an intervention.”

—Lawrence Haddad, Senior Research Fellow, IFPRI; Co-Chair, Global Nutrition Report, GNR 2015 launch, New York

International launch of the Global Nutrition Report 2015.



OCTOBER

Expo Milano 2015: Feeding the Planet, Energy for Life closes after 184 days of events designed to come up with solutions for issues related to sustainable development and food security.

DECEMBER

First-ever estimates on the global burden of foodborne diseases published by the World Health Organization’s Foodborne Disease Burden Epidemiology Reference Group (FERG).



The UN hosts the 21st session of the Conference of the Parties (COP21) to the UN Convention in Paris, ending with the adoption of the first international climate agreement concluded by 195 countries.



Almost 1/3 of all deaths from foodborne diseases are in children under the age of five years, despite the fact that they make up only 9% of the global population. —WHO Estimates of the Global Burden of Foodborne Diseases, 2015

AUGUST

A4NH submits a pre-proposal describing its plans for a second phase of the CGIAR Research Programs (CRPs).

SEPTEMBER



Special issue of the *Journal of Development Studies* on Farm-Level Pathways to Improved Nutritional Status published. Six of the eight studies were coauthored by A4NH-affiliated researchers.

The CRP external evaluation panel finalizes and submits **external evaluation report** to A4NH and stakeholders.

A4NH researchers from the International Institute of Tropical Agriculture (IITA) present best practices at a regional workshop on mitigating aflatoxins, organized by the Partnership for Aflatoxin Control in Africa Secretariat and others.

Clinton Global Initiative holds panel on strategic partnerships for nutrition, featuring **biofortification**.

OCTOBER

External advisors for the second phase of the Gender, Agriculture and Assets Program (GAAP2) meet and prepare for the official January 2016 launch.

The Ministry of Agriculture in Bangladesh officially launches new pilot project, Agriculture, Nutrition, and Gender Linkages (ANGeL), to identify actions and investments in agriculture that can contribute to improved nutrition.

A4NH is invited to prepare a full proposal for a second phase of the program (2017–2022) for submission in March 2016.

A4NH researchers and partners submit **set of 11 technical papers** to the East Africa Community Multi-sectoral Ministerial Council on aflatoxins, in which all policy recommendations were adopted.

NOVEMBER

The Sackler Institute for Nutrition Science and Bush Brothers & Company invite the A4NH director to serve on the Scientific Organizing Committee for an **event** at the New York Academy of Sciences to launch the International Year of Pulses 2016.



“The CRP is tackling highly relevant issues, has been influential both internationally and within CGIAR, and includes some world-renowned researchers and research programs.”

—A4NH external evaluation team, 2015



PHOTO TOP LEFT: IFPRI IMAGES
PHOTO TOP RIGHT: UN PHOTO/RICK BAJORNAS
PHOTO BOTTOM RIGHT: NEIL PALMER (CIAT)



Aligned to Improve Nutrition and Health:

SUPPORTING COUNTRY AND GLOBAL GOALS

When CGIAR first introduced a Strategy and Results Framework (SRF) in 2010, it provided the guiding structure for 16 unique CGIAR Research Programs (CRPs), including A4NH, to deliver impact.

In May 2015, a new CGIAR results framework was approved, guiding our work from 2016–2030. Its goals are ambitious, but achievable. By 2030, the work of CGIAR and its partners will result in 150 million fewer hungry people, 100 million fewer poor people—at least 50 percent of whom are women—and 190 million hectares less degraded land.

The new framework reflects the fact that agriculture, and therefore agricultural research, is expected to contribute to multiple system-level outcomes (SLOs), such as **improved food and nutrition security for health**, one of the three overarching CGIAR goals. More immediate goals include **improved diet quality for poor and vulnerable people**, **improved food safety**, and **improved human and animal health from better agricultural practices**. An increased profile for health reflects rising global concern about health risks and an understanding that agriculture and food systems can contribute to better health. The SRF also emphasizes an enabling policy environment, women’s empowerment, and strengthened capacity as goals in their own right and as contributors to other outcomes. A4NH’s own results framework and theories of change that we reported last year map well to the new SRF and provide more detail about how CGIAR investments will contribute to achieving high-level goals in the area of nutrition and health.

The CGIAR framework aligns with the United Nation’s Sustainable Development Goals (SDGs), especially those that specifically target nutrition, health, and social development

outcomes. Adopted by 197 countries in September 2015, the 17 ambitious SDGs define the global development agenda for ending poverty, protecting the planet, and ensuring prosperity for all, from 2016 through 2030. For example, goals such as SDG 2—Zero hunger, and SDG 3—Ensure healthy lives and promote well-being for all at all ages—confirm global commitment to maternal and child health and to addressing tropical and neglected diseases. SDG 3 also recognizes the growing problem of overweight and obesity in developing countries and includes a target on reducing mortality from noncommunicable diseases (NCDs). A4NH is taking on the double burden of undernutrition and overnutrition through its increased focus on food systems for healthier diets.

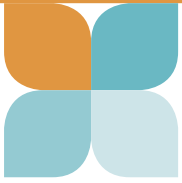
A4NH is committed to working with countries to develop and track indicators to measure and maintain intermediate progress toward these shared longer-term goals. The *Global Nutrition Report* (GNR), published by IFPRI with contributions from A4NH researchers, tracks data on key nutrition indicators and provides important analysis to guide policy and investment in order to help countries get and stay on track. Specifically in Africa, the new 2015–2025 Results Framework developed by the Comprehensive Africa Agriculture Development Programme (CAADP) includes nutrition indicators to guide African Union (AU) Member States toward common development goals that can improve nutrition and health outcomes in the region. A4NH supports its implementation at national levels by generating and sharing context-specific evidence to inform policies and programs and monitor and evaluate progress. ■

A4NH Alignment with CGIAR and Global Goals





FLAGSHIP 1:



Value Chains For Enhanced Nutrition

Identifying opportunities to improve nutrition and diet quality along value chains to increase poor people's access to and consumption of nutritious foods.

FROM CONSUMPTION BACK TO PRODUCTION

This research area assesses nutritional quality starting with consumption, working back to production, and considering both informal and formal value chains. To improve human and environmental health, it examines the broader context of what people eat by applying a food systems lens to better connect agriculture, the environment, and diets in specific contexts where we work.

Evidence and methods help value-chain actors, policy makers, farmers, and nongovernmental organizations (NGOs) to better design, assess, and improve value chains for nutrition, so that more nutritious food can reach the farms and tables of poor people who need it most.

A FRAMEWORK PUT TO GOOD USE

Research on nutrition-sensitive value chains accelerated in 2015. New project results provided important insights into food system dynamics in two types of urban markets in Kenya and Uganda (Nairobi and Kampala) and rapidly urbanizing towns (Kisumu and Mukono). A new study with the IFPRI-South Asia office began investigating different forms of public-private models to improve nutrition and health through agriculture and to develop sustainable and nutritious food systems.

Following a March 2014 workshop convened by A4NH, researchers and practitioners developed a framework to support the identification, design, and evaluation of nutrition-sensitive value-chain interventions. Officially published as an **IFPRI Discussion Paper** and **Research Brief**, the framework was tested and used on a range of projects throughout the year by external partners and by A4NH. Specifically, a team from the International

Center for Tropical Agriculture (CIAT) **applied the framework** to their study in Kenya and Uganda on beans, a key dietary staple, and amaranth, a nutrient-dense vegetable. The World Food Programme (WFP), along with IFPRI, has been conducting operational research guided by the framework in Malawi. A researcher affiliated with Leveraging Agriculture for Nutrition in South Asia (LANSA), a research program funded by the United Kingdom's Department for International Development (DFID), has been using the framework in research on fruits and vegetables in India.

Through A4NH's partnership with the International Fund for Agricultural Development (IFAD), the framework has been

"Through a unique and valuable partnership, A4NH and IFAD have been mainstreaming nutrition across policy and operations with a commitment to have all country strategies and a third of projects nutrition-sensitive."

—Iain MacGillivray, Special Advisor on Nutrition to the President of IFAD



widely disseminated and used in project design over the past year. With funding from the Government of Germany, IFAD is developing guidance on the design of nutrition-sensitive value chains, and is currently carrying out fieldwork in Indonesia and Nigeria. Following an extensive literature review, IFAD modified the framework to increase the focus on how value chains can improve the nutrition of smallholder producers, the primary beneficiaries of IFAD's investments. Following review by several expert groups, this framework now underpins

FLAGSHIP 1 HAS THREE MAIN OBJECTIVES:

- ① Improve diet quality for women, infants and young children, and vulnerable groups
- ② Empower women and vulnerable groups
- ③ Contribute to an enabling environment for nutrition and health



EAT: SCIENCE, POLITICS, AND BUSINESS SHARING FOOD FOR THOUGHT

A4NH not only examines specific food value chains that can lead to improved nutrition, but also responds to concerns about global diet trends and demands from countries for systemic solutions that address problems, such as food insecurity, undernutrition, and overnutrition. Specifically, we are expanding our research on food systems, that is, the full set of processes, activities, infrastructure, and environment that encompass what people grow, move, and eat.

One platform that is addressing food, health, and sustainability issues across sectors is the EAT Initiative, created by the Stordalen Foundation and Stockholm Resilience Centre in 2013 to foster collaboration and research across scientific disciplines interfacing with food issues. Through our partner, Bioversity International, A4NH is engaging with the EAT Initiative on work related to metrics for sustainable diets.

In October 2015, EAT, the Stockholm Resilience Centre, and CGIAR organized a “writeshop” called “Healthy People, Healthy Planet: Linking Diets to Food Production Landscapes.” Over two days, an expert academic group worked on identifying the levers of change needed to produce enough nutritious, high-quality food in a sustainable and environmentally responsible manner to feed an ever-increasing population. Two months later, at the Global Landscapes Forum in Paris, these organizations jointly organized a moderated panel session entitled “Landscapes and Seascapes for Food, Nutrition and Environment: Exploring the Business, Policies and Science Connections.”



“We are facing enormous health-related dietary challenges, and at the same time we are facing huge planetary sustainability challenges. Food is the driver in both of these, and the homogenization of both landscapes and diets seems to be at the core.”

—Line Gordon, associate professor and deputy science director, Stockholm Resilience Centre

IFAD’s approach to development of value chains for nutrition, and was specifically used to support value chain projects for a range of commodities from grains to fish in Indonesia, Laos, Nicaragua, and Rwanda.

Lastly, leading up to the official launch of the United Nations’ International Year of Pulses 2016 (**IYP 2016**), A4NH played an active role to raise the global profile of pulses as important sources of essential nutrients. The A4NH director served on the Scientific Organizing Committee for the event, “Little Beans, Big Opportunities: Realizing the Potential of Pulses to Meet Today’s Global Health Challenges,” in November 2015 at the New York Academy of Sciences.

NEW SUPPORT FOR EXPANDED TESTING

Several ongoing studies will culminate in 2016, including assessments of rural, peri-urban, and urban value chains for nutritious foods, and evaluations of platforms to improve consumer awareness of the importance of diverse diets. New funding in 2016 will support the continued application of A4NH’s framework on nutrition-sensitive value chains. CIAT secured funding from the German Federal Ministry for Economic Cooperation and Development (BMZ) for a three-year project (2016–2018) that will test market-based solutions to improve diets of poor consumers, specifically women of reproductive age and children under five years of age in Kenya and Uganda. With new funds from the Innovative Metrics and Methods for Agriculture and Nutrition Actions (IMMANA) research initiative, supported by DFID, IFPRI will lead a team with the World Agroforestry Centre (ICRAF) and WFP in Malawi to refine the framework and validate theory-based

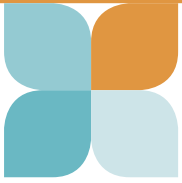
methods and metrics to support the identification, design, and evaluation of nutrition-sensitive value-chain interventions. These new studies are filling critical evidence gaps on the potential of this approach and the best ways to develop value chains to improve nutrition.

Also in 2016, a cluster of activities on nutrition-sensitive landscapes will publish, with our partner CRPs, results from pilots on how value chains for nutritious foods can be expanded to encompass the broader concept of healthy and sustainable diets in Kenya, Vietnam, and Zambia. A4NH and our partners will continue to take an active role in IYP 2016-related activities, specifically in Africa and South Asia, which also provides an opportunity for launching future research initiatives such as global, Indian, and Ethiopian Pulse Innovation Platforms. ■

PHOTO: BIOVERSITY INTERNATIONAL | F. DE LA CRUZ



FLAGSHIP 2:



Biofortification

Improving the availability, access, and intake of biofortified nutritious staple foods for the poor.

DELIVERING NUTRIENT-RICH STAPLES

Through HarvestPlus, this flagship develops, tests, and disseminates biofortified nutrient-rich staple food crops targeted to malnourished populations, particularly in Africa south of the Sahara and South Asia. By increasing production and consumption of biofortified staple foods, this research is reducing the prevalence of iron, zinc, and vitamin A deficiencies.

Biofortification research has demonstrated that breeding for increased nutrient levels is successful—that is, high nutrient content can be combined with high yields and high profitability. The micronutrient status of people has been shown to improve after consuming foods made with biofortified crops. Current research further builds the case to support scaling up delivery of biofortification, with a goal of reaching 100 million people by 2020.

OPERATIONAL RESEARCH FOR INCREASED DELIVERY

In 2015, HarvestPlus completed the second year of a five-year delivery phase, focusing on operational research and collaborating closely with public and private sector partners to reach farm households in nine target countries. HarvestPlus reached almost 2 million farming households with biofortified crops and, by the end of 2015, we estimate that approximately 15 million people in Africa, Asia, and Latin America were growing and eating biofortified staple foods. This new evidence generated by HarvestPlus on biofortification provides national policy makers and investors with renewed confidence to further support and scale biofortification as a highly effective strategy for addressing hidden hunger (micronutrient deficiencies) for the poor.

FLAGSHIP 2 HAS THREE MAIN OBJECTIVES:

- ① Make high-yielding, micronutrient-enhanced varieties available to NARES and implementing partners in target countries
- ② Support nutrition and health communities promoting biofortified crops of demonstrated nutritional efficacy
- ③ Implement delivery programs to ensure adoption and consumption of biofortified varieties in target countries



Key findings published in 2015 included evidence that **iron pearl millet** significantly improved iron status in school children, and that **beans** are an effective crop for iron biofortification. Research began to shift toward gauging longer-term impacts on improving population-level nutrition and health indicators and sustainability. For example, a **recent study on the health benefits of biofortified orange sweet potato** in Mozambique showed improvements in child health, including a 52 percent reduction in the prevalence of diarrhea in children under three years of age. Some specific achievements, by flagship objective, are highlighted below.

Made high-yielding, micronutrient-rich varieties available to National Agricultural Research and Extension Systems (NARES) and implementing partners in target countries.

- Two zinc rice varieties released in Bangladesh
- Three vitamin A orange maize varieties released in Zambia
- Extensive commercialization of zinc wheat and iron pearl millet hybrids in India



FROM TESTING TO SCALING

“For me, the challenge is no longer the science of biofortification—we know it works. Our challenge as policy makers is to scale up biofortified crops to reach millions of households through institutional, regulatory, and financial policy.”

—Dr. Akinwumi Adesina, President of the African Development Bank and former Minister of Agriculture and Rural Development in Nigeria, at Second Global Conference on Biofortification, 2014

BIOFORTIFICATION IN NUMBERS

As of the end of 2015, more than **100 biofortified varieties** of **10 crops** have been released in **30 countries**. Multi-locational trials of promising candidates for release are underway in more than **20 additional countries**. Globally, a total of **54 countries** have released HarvestPlus–associated biofortified crops, are conducting related multi-locational trials, or both. We estimate that **15 million people** in Africa, Asia, and Latin America are growing and eating biofortified staple foods.

PHOTO: BIODIVERSITY INTERNATIONAL/P. BORDONI



Collaborated with nutrition and health communities to promote biofortified crops of demonstrated nutritional efficacy.

- Results from the iron pearl millet efficacy study were published, demonstrating that **iron pearl millet is efficacious** in improving iron status in children. Eating iron-rich pearl millet significantly improved the iron status of school children (aged 12 to 16 years) in four months, compared with ordinary pearl millet. Those children who were iron deficient at the start and ate iron-rich pearl millet were 1.6 times more likely to have resolved their iron deficiency compared with those who ate ordinary pearl millet.
- The results of a cassava efficacy trial with Kenyan rural school children supports biofortified cassava as an efficacious new approach to improve vitamin A status. In the study population, boiled yellow cassava consumption led to **modest but significant gains** in serum retinol concentration and a large increase in circulating levels of beta carotene.

Made progress with delivery programs in which farmers adopted and consumers ate biofortified varieties in target countries.

- Reached approximately 15 million people with biofortified crops by end of 2015
- Continued developing biofortified food products
- Implemented effectiveness study in Guatemala and impact assessment in Rwanda

Based on the growing body of evidence, several national and international bodies are now incorporating biofortified crops into their policies and programs, including WHO, Codex Alimentarius (a collection of internationally recognized standards on foods, food production, and food safety), and the World Bank.

TRACKING AND MEASURING DELIVERY PROGRESS

In 2016, researchers from this flagship will continue increasing delivery of biofortified crops by building capacity of CGIAR and key research partners to mainstream high levels of

micronutrients into multidimensional breeding programs, providing evidence for targeting biofortification interventions, and through policy analysis and advocacy supporting the integration of biofortification into national and regional policies and investment plans.

Building on the A4NH-supported effort to develop and refine theories of change for specific crops and countries, an improved Monitoring, Learning, and Assessment system will be in place in 2016 to better track indicators of progress toward key outcomes.

Lastly, this flagship will continue to emphasize breeding of enhanced varieties of staple crops and nutritional efficacy and effectiveness studies of biofortified crops. Results from several of these activities, such as evidence on the bioavailability of zinc rice and efficacy studies on provitamin A cassava, will be published in 2016. National and global-level policy engagement activities will continue to support decision makers with evidence-based information on biofortification. Lastly, a definition for biofortified products will be presented in the 2016 session of the Codex Committee on Nutrition and Foods for Special Dietary Uses. ■

PHOTO: FINN THILSTED, WORLD FISH



FLAGSHIP 3:



Agriculture-Associated Diseases

Addressing food safety issues, including zoonotic disease control and better management of agricultural systems, to reduce the risk of human diseases.

UNDERSTANDING, CONTROLLING, AND MITIGATING RISKS

Mitigating food safety risks, including foodborne and agriculture-associated diseases, requires not only a nuanced understanding of agrifood systems across contexts, but also cooperation between national and global actors. In this flagship, A4NH focuses on research in three areas: aflatoxin contamination of food and feed, food safety of perishable products, and emerging disease risks associated with agriculture.

We conduct agriculture and public health research, informed by socioeconomic, gender, and ecological thinking, to improve understanding of the multiple burdens of diseases associated with agriculture and to identify and test management and control options. Results from our studies of agriculture-associated disease risks help decision makers, value-chain actors, NGOs, and farmers make more informed decisions about management and control of disease exposure.

FEEDING EVIDENCE INTO GLOBAL POLICY AND PRACTICE

In 2015, A4NH scientists from the International Livestock Research Institute (ILRI) contributed to several high-profile results to reduce health risks associated with consuming perishable foods. Following a nine-year effort, WHO's Foodborne Disease Burden Epidemiology Reference Group (FERG), which includes ILRI representation, produced the **first global assessment of foodborne disease**, covering 31 foodborne disease hazards that together cause at least 620 million illnesses a year. The evidence confirms that the highest incidence of foodborne disease is in Africa, followed by Southeast Asia.

A4NH's role in global livestock and health policy in 2015 included three DFID-commissioned evidence reviews on: agriculture-associated antimicrobial resistance in developing countries, food safety in developing countries, and **Middle East Respiratory Syndrome**, as part of Evidence on Demand, an

online hub that offers relevant resources and expertise for evidence-based decision making. The Flagship 3 leader from ILRI served as a member and coauthor of the Lancet Commission on Health and Climate Change. **A 2015 article** in *The Lancet* maps out the impacts of climate change and policy responses to ensure the highest attainable standards of human health for populations worldwide.

Other A4NH contributions include a chapter on **"Food Safety: Reducing and Managing Food Scarcities"** in IFPRI's 2014–2015 *Global Food Policy Report* and a **synthesis of risk analysis in 20 livestock and fish value chains** in Africa and Asia, which suggested that variations in risk exposure between men and women are mainly due to gender-based differences in occupational exposure and consumption patterns.

A4NH continues to promote the EcoHealth approach to managing zoonotic and emerging diseases, which takes account of how changes in regional ecosystems can affect human health. According to a case study from Vietnam, there is increased acceptance and adoption of this approach in Southeast Asia.

SCALING AND COORDINATING WORK ON AFLATOXINS

Concerns about aflatoxins have reached the Africa Union Commission (AUC) and the East African Community (EAC). A4NH researchers provided background studies and technical support to the AUC's Steering Committee of the Partnership for Aflatoxin Control in Africa (PACA), a collaboration which aims to protect crops, livestock, and people from the effects of aflatoxins. **A series of 11 technical papers** prepared by the International Institute of Tropical Agriculture (IITA), ILRI, IFPRI, and other A4NH partners in 2015 were adapted into policy briefs for EAC member states by the Regional Expert Working Group on Aflatoxins.

PHOTO: YOUSUF TUSHAR, WORLDFISH



FLAGSHIP 3 HAS THREE MAIN OBJECTIVES:

- ① Reduce exposure to health risks
- ② Empower women and vulnerable groups
- ③ Contribute to enabling policies and investments

A DISEASE CONTROL FRAMEWORK PUT TO THE TEST



Rift Valley fever (RVF) is a severe mosquito-borne disease affecting humans and domestic ruminants. Outbreaks of RVF can have major societal impacts, including significant economic losses and trade reductions. RVF epidemics are more and more frequent in Africa and the Middle East, probably in relation to climatic changes.

Since it was developed by ILRI and local and international partners in 2012, the **decision support framework** (DSF), a tool to guide timely and evidence-based decision making in response to heightened risk of RVF, has been widely referenced and put to good use. The DSF informed Kenya's official Contingency Plan and other standard operating procedures for RVF control and was also disseminated as a reference to other high-risk areas. Toward the end of 2015, when warnings for El Niño

rains were given, the DSF's risk maps helped partners in Kenya develop better plans for managing RVF.

A recent **review of how the framework for RVF** has been utilized in Kenya spurred new uses in high-level preparedness training in 2015. The framework was **included in a regional conference** convened by the World Organization for Animal Health and FAO in Djibouti in April 2015, as well as a series of six training workshops on Good Emergency Management Practices, organized by FAO.

The aflasafe™ biocontrol method for reducing aflatoxins gained traction in 2015, following efficacy studies that led to its registration in Kenya, Nigeria, and Senegal. Adoption studies are ongoing in Nigeria, and the Kenyan government is investing directly to scale up the adoption of aflasafe™. A4NH is studying a range of control approaches, including **triple-layer storage bags**, known as Purdue Improved Crop Storage bags, which were tested for efficacy by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), as well as market interventions in which IFPRI convened Kenyan maize value-chain stakeholders to establish market linkages among providers of aflatoxin control technologies, farmer organizations, and millers offering premium prices for safe grain. Since no single technology or intervention will control aflatoxin risks, A4NH has taken the lead in coordinating CGIAR researchers through the use of **theories of change** for aflatoxin control to better understand the different pathways for reducing aflatoxin risk.

CONTINUED AND EXPANDED AREAS OF RESEARCH

In 2016, critical research on aflatoxins will continue, including mapping of hotspots and risk assessments, building capacity of national partners and farmers to use existing technologies, and testing consumer perceptions and strategies for improving food safety. Results from ongoing trials to assess the

relationship between aflatoxin exposure and child growth are expected after 2016. The Safe Food Fair Food project will begin dissemination efforts to share results and recommendations for improving food safety in animal-source food value chains, primarily in Africa. With partners from other CRPs, final results from a pilot study in Zambia are expected to describe the foodborne disease risks and recommend food safety priorities. Final results are expected from studies through the IITA-led Agro-Eco-Health Alliance in West and Central Africa on the contribution of poor irrigation and water management to malaria vectors, and also on the health risks to producers and consumers from peri-urban vegetable production and consumption. In Southeast Asia, frameworks for predicting and managing disease risks will be disseminated to users and policy makers. Building upon years of surveillance research in Kenya, A4NH, with Kenyan partners, will present a plan for an integrated electronic surveillance system for zoonotic diseases in both humans and animals.

A4NH took steps in 2015 to expand its health component by convening global health experts and development partners in three regional consultations to discuss gaps, needs, and priorities in health research. ■



“It is critical that researchers study both the potential benefits and risks when it comes to agriculture’s impact on human health. Involvement with livestock production systems, for example, can improve human health through better nutrition, economic empowerment, and access to commercial markets; concurrently, we know that keeping, handling, and consuming livestock products can present farmers and consumers with significant risks for transmission of pathogens. It is of great value to invest in research that examines both sides of the equation. A4NH is well placed to bridge the public health and agriculture sectors, and to create a forum for interdisciplinary partnership.”

—Eric Fèvre, Professor of Veterinary Infectious Diseases, Institute of Infection and Global Health, University of Liverpool, UK, jointly appointed with the International Livestock Research Institute (ILRI) in Nairobi, Kenya; FERG member

FLAGSHIP 4:



Integrated Programs and Policies

Addressing the need for integration among the agriculture, nutrition, and health sectors, at both the program and policy levels.

MEETING DEMAND FOR EVIDENCE

Led by researchers from IFPRI's Poverty, Health, and Nutrition Division, this flagship includes a portfolio of high-quality evaluative research in various stages, on a range of integrated agriculture-nutrition programs. The research responds to increased demand for evidence from development and agriculture partners, policy makers, and investors on what is proven effective for addressing undernutrition. The evidence generated and policy engagement support offered help improve the design and delivery of nutrition-sensitive programs and policies that feed into regional and national nutrition targets. This research contributes to strengthening different models of interventions to improve diet quality, empower women and other vulnerable groups, and contribute to achieving health and nutrition outcomes.

EXPANDING THE GLOBAL EVIDENCE BASE ON WHAT WORKS TO IMPROVE NUTRITION

Several multi-year evaluations of nutrition-sensitive development programs concluded in 2015, including the Bill & Melinda Gates Foundation (BMGF)-funded Alive and Thrive (A&T) project in Bangladesh, Ethiopia, and Vietnam, and the USAID-funded (through FANTA-3) Preventing Malnutrition in Children under Two Years of Age (PM2A) project in Guatemala and Burundi. Final results from these projects will be published in 2016.

In the area of nutrition-sensitive agriculture programs, A4NH continued to support an impact

FLAGSHIP 4 HAS THREE MAIN OBJECTIVES:

- ① Evaluate and strengthen nutrition-sensitive agriculture interventions, particularly those targeted at pregnant women and young children
- ② Evaluate and strengthen multisectoral nutrition-sensitive development programs and policies and scaled up nutrition-specific programs
- ③ Develop tools, methods, and approaches for understanding, influencing, and evaluating cross-sectoral policy processes related to nutrition-sensitive development

evaluation of the Home-Grown School Feeding (HGSF) program in Ghana, an IFPRI-led **dairy value-chain project** in Senegal, and the Creating Homestead Agriculture for Nutrition and Gender (CHANGE) project implemented by Helen Keller International (HKI) in Tanzania and Burkina Faso, with funding from Global Affairs Canada. The Realigning Agriculture to Improve Nutrition (RAIN) project implemented by Concern Worldwide and evaluated by IFPRI in Zambia ended in 2015.

Results from a rigorous evaluation (the first randomized controlled trial [RCT] of its kind) of the Enhanced-Homestead Food Production Programs (E-HFP) in Burkina Faso, implemented by HKI, confirmed that integrated agriculture programs **can improve nutrition and health** in both women and children, **can empower women**, and may change gender norms. Findings were widely promoted through **blog, video**, and media channels.

In 2015, the BMGF-funded Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India (POSHAN) continued its efforts to reduce the nutrition evidence gap in India by synthesizing, generating, and mobilizing nutrition evidence. The team completed operational assessments on delivering nutrition-specific interventions in two Indian states, a baseline to test the value-added of bringing an additional worker to deliver nutrition services, and a costing study on scaling up nutrition-specific interventions across India.

New fieldwork began, led by Tufts University, IFPRI, and FAO, to investigate how Household Consumption and Expenditure Survey (HCES) data can help address the current dietary data gap through the BMGF-funded International Dietary Data Expansion (INDDEX) project. Advancing Research on Nutrition and Agriculture (ARENA), a BMGF-funded multi-country study on the links between agriculture policies and nutrition, completed its first full year in 2015.

RESEARCH TO EMPOWER AND ENABLE CHANGE

A4NH continues to invest in regional partnership platforms and consortia, including LANSAs and **Transform Nutrition**, that offer evidence-based guidance to help decision makers create better-informed policies and programs to enhance the impact of agriculture on nutrition and health; in essence: research that facilitates change.

In 2015, LANSAs conducted a statistical analysis of drivers of nutritional change in Bangladesh, India, Nepal, and Pakistan. **Transform Nutrition** entered its synthesis phase and launched the Stories of Change initiative to fill a key gap in the experiential evidence base for nutrition. In-depth case studies are being developed from five countries (Bangladesh, Ethiopia, Nepal, Senegal, and Zambia) and one Indian State (Odisha) to explore

HOMESTEAD FOOD PRODUCTION PROGRAMS WORK!

New evidence from an **A4NH-supported study**, led by IFPRI, helped fill a critical evidence gap. The evaluation of HKI's gender- and nutrition-sensitive Homestead Food Production (HFP) program in Burkina Faso, a two-year program that ended in 2014, was the first to use an RCT to rigorously test and document the impact of an integrated agriculture program on mother's and children's health and nutrition and women's empowerment outcomes. Changes were made to improve the program in real-time, and results were seen in participants in just two years.

- Mothers who participated in the program
 - Were less likely to have a low body mass index (BMI).
 - Experienced improved social status and increased likelihood to participate in household decision making.
- Young children who participated in the program had lower prevalence of
 - Anemia, reduced by 15 percentage points (for children 3–6 months old at the start of the program).
 - Wasting (being too thin), reduced by 9 percentage points (for children 3–12 months at the start).
 - Diarrhea (which can contribute to wasting), reduced by 10–16 percentage points (for children 3–12 months at the start).

This study paves the way for more rigorous studies to help improve the design and implementation of integrated agriculture programs seeking to improve health and nutrition outcomes.

According to Deanna Olney, senior research fellow at IFPRI and coauthor of the E-HFP study,

“Almost all children in Burkina Faso are anemic and many are stunted and/or wasted. Too few programs are able to provide the substantive, sustainable change that this population so desperately needs.”



PHOTO: A.W./ANISUZAMAN, WORLDFISH

the factors contributing to improvements in nutritional status. Findings will also contribute to *Nourishing Millions*, a book of success stories in reducing malnutrition compiled by IFPRI.

Lastly, the **GNR 2015** was launched in New York in September 2015, immediately prior to the launch of the SDGs. It builds on the success of GNR 2014 to galvanize the nutrition community to action, but goes further to reach out to new constituencies—in climate change, food systems, and business—with calls to encourage cross-sectoral innovation to promote change.

INTEGRATING NUTRITION AND HEALTH INTO OTHER SECTORS

Several exciting new projects in South Asia with strong gender components were launched in 2015. A4NH researchers from Flagship 4 are leading the evaluations of the Agriculture, Nutrition, and Gender Linkages (**ANGeL**) pilot project, which is implemented by the Bangladesh Ministry of Agriculture and HKI and jointly funded by the Government of Bangladesh and USAID, as well as the BMGF- and DFID-funded Targeting and Realigning Agriculture for Improved Nutrition (**TRAIN**) project, implemented by BRAC in Bangladesh, and the Women Improving Nutrition through Group-based Strategies (**WINGS**) project, implemented by PRADAN in India. The evaluations will help us learn more about the impacts of different nutrition- and gender-sensitive programs.

In 2016, we eagerly anticipate the release of *Stories of Change*, a synthesis of country-level case studies from policy makers, nutrition leaders, and implementers on the drivers of nutrition impact, compiled by Transform Nutrition. In addition, several process and impact evaluations from a variety of contexts in Africa and Asia, and from different types of nutrition-sensitive programs, will be finalized and offer new evidence on the best approaches for multisectoral programs to achieve improved nutrition. Lastly, GNR 2016 will continue building and sustaining commitment to improving nutrition. ■

A4NH IN ACTION ///

Enabling Environments for Better Nutrition: A Global Snapshot

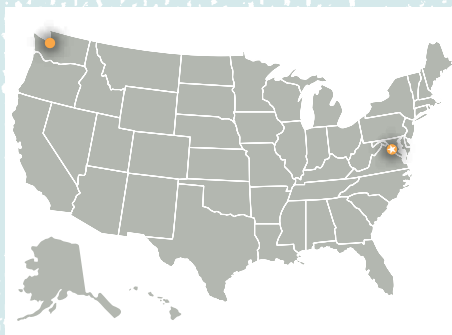
With close links to both the direct causes and the underlying determinants of undernutrition, the agriculture sector has the potential to dramatically improve nutrition outcomes. However, even in countries where a high dependence on agricultural livelihoods coexists with a high burden of undernutrition, large investments in agricultural policy and practice have **generated relatively small improvements in the nutritional status of the population**. For agriculture to meet its full potential for improving nutrition and health outcomes, a strong enabling environment is needed.

What is an enabling environment?

Simply put, an enabling environment is one in which policies and programs are intentionally designed to support nutrition and health goals, and where those who design and implement them have the capacity and resources to do so.

An enabling environment also recognizes that, given the multisectoral nature of nutrition, integrated solutions are necessary, as is close coordination with other sectors, such as water, sanitation, and hygiene (WASH) interventions or immunization and promotion of use of health services, in order to maximize the potential impact on nutrition. To create and strengthen enabling environments in countries and regions around the world, A4NH and its partners work closely with governments, policy makers, and investors across sectors to provide the evidence base, knowledge, tools, and technical inputs to help decision makers make smarter policy choices and investments that enhance the impact of agriculture on nutrition and health. Here is a global snapshot of some of A4NH's contributions to enhance nutrition-sensitivity in development programs or policies.

EVIDENCE AND TOOLS FOR SMART INVESTMENTS



- Researchers, donors, NGOs, and governments have widely adopted A4NH-developed frameworks, evidence, and tools to inform and guide programs and investments. The **framework on the pathways through which agriculture impacts nutrition** informed agriculture-nutrition strategies of USAID and BMGF.
- The IFPRI-led **Global Nutrition Report**, written by an international expert group, including a number of A4NH researchers, synthesizes data and evidence to serve as a roadmap for countries and decision makers who want to see improvements in health and nutrition outcomes in specific contexts.



“There’s a great deal of appetite—not just in the nutrition community, but in other critical sectors—to do something about nutrition.”

—Leith Greenslade, Millennium Development Goals Health Envoy, GNR 2015 launch, New York

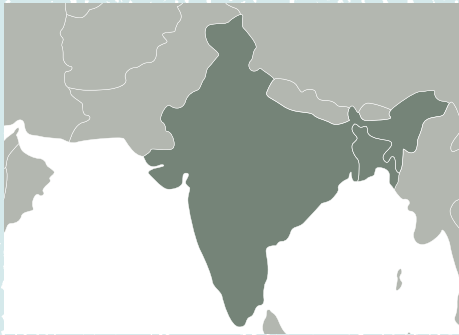
A ROME-BASED PARTNERSHIP EVOLVES



- In 2013, A4NH and IFAD began a formal partnership to support the mainstreaming of nutrition into IFAD investments and into country strategies and projects to promote more nutrition-sensitive agriculture and rural development around the world.
- IFAD and the other Rome-based UN agencies, WFP and FAO, as well as IFPRI, formed the Sustainable Value Chains for Nutrition Discussion Group to share experiences, information, and tools.
- IFAD, WFP, FAO, and A4NH are among the organizations that contributed to, and are now disseminating, testing, and piloting an A4NH **framework** on nutrition-sensitive value chains, published in early 2015.
- A4NH's partnership with IFAD has helped IFAD reach its goal of seeing 22 percent of their projects and 50 percent of their country strategies considered nutrition-sensitive by 2015. Their new goals are even higher: 33 percent of projects and *all* country strategies considered nutrition-sensitive by 2018.



DEEPENING NUTRITION POLICY DIALOGUE IN SOUTH ASIA



- A4NH helps strengthen partnerships and capacity development to support country leadership and performance for nutrition and health outcomes, especially in South Asia. This is done through several prominent research consortia, including LANSAs and Transform Nutrition, and through **POSHAN**, a project that synthesizes, generates, and mobilizes nutrition evidence in India to reduce the nutrition evidence gap.
- In 2015, Transform Nutrition published the *India Health Report on Nutrition 2015*, which surveys trends in maternal and child undernutrition in India across geographical regions, socioeconomic classes, and demographic groups to deepen and focus the policy dialogue in India, raise awareness about the multisectoral nature of undernutrition, and highlight areas for action, especially at the state level, in order to improve child nutrition.

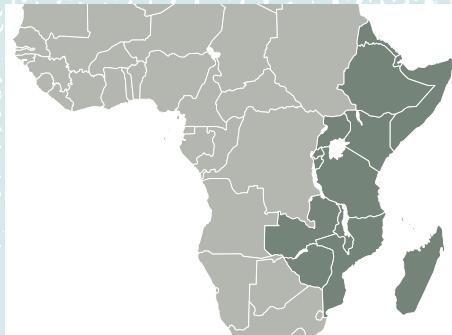
**transform
nutrition**



“The aflatoxin challenge is too big and too complex to be left to any single player or single solution alone. Experience from decades of piecemeal and fragmented approaches that didn’t come close to addressing the challenge points to the need for coordinated approaches, such as what A4NH offers.”

—Dr. Amare Ayalew, PACA Program Manager, Department of Rural Economy and Agriculture, African Union Commission

COORDINATED AFLATOXIN SUPPORT IN EAST AFRICA



- As concerns about aflatoxin contamination grow, especially in Africa where the threat is highest, A4NH has stepped in with evidence and technical support to help decision makers and policy makers create smart policies. A4NH and partners have assembled significant evidence on how to manage, control, and prevent aflatoxin contamination, including a set of 19 **policy briefs** published in 2013 guiding prevention and response actions. A4NH researchers provided background studies and technical support to the AUC’s Steering Committee of PACA, a regional collaboration to protect crops, livestock, and people from the effects of aflatoxins. In 2015, a **series of 11 technical briefs**, coordinated by IITA with ILRI, IFPRI, and other A4NH partners, was prepared for the EAC Multi-sectoral Ministerial Council, which adopted all policy recommendations. With the Regional Expert Working Group on Aflatoxins, these were then adapted into policy briefs for EAC member states.



MAINSTREAMING NUTRITION INTO AFRICA’S AGRICULTURE SECTOR



The Comprehensive Africa Agriculture Development Programme (CAADP) is an Africa-wide program, spurred by heads of AU member states, toward common development goals for the continent and its regions. Following its first decade, CAADP has increased its focus on mainstreaming nutrition by incorporating nutrition into National Agricultural Investment Plans. The **Malabo Declaration** of June 2014 committed to ambitious goals: zero hunger and decreasing stunting by 10 percent and underweight by 5 percent in Africa by 2025. Agriculture will play a key role in the strategy to address nutrition challenges.



- As part of operationalizing the Malabo commitments, CAADP developed a new **Results Framework (2015–2025)**, which, for the first time, includes nutrition indicators and a clear mandate for investments and actions to meet nutrition targets throughout Africa.
- A4NH, along with others, is providing data to facilitate monitoring under the new CAADP Results Framework and will help track progress of the CAADP indicators.
- An A4NH research coordinator, who was involved with mainstreaming nutrition into CAADP, is currently based in Ethiopia and is supporting A4NH’s ongoing efforts to integrate nutrition into Africa’s agriculture sector. ■

A4NH IN ACTION ///

Building Knowledge: Working Toward Change

Four years in, A4NH has generated new analysis and evidence to better understand the intersection of agriculture, nutrition, and health. The good news is that we are even more confident today than when we started our work in 2012 that agriculture has the potential to improve people's nutrition and health status, if leveraged properly. This follows decades in which researchers and implementers faced a huge evidence gap on whether or not agriculture is a valid or effective pathway for improving health outcomes.

Every year, A4NH analyses help answer the question, "Does better agriculture mean better nutrition?" And each year, our findings help demonstrate that yes, nutrition-sensitive agriculture can work and yes, there are clear linkages between agriculture, nutrition, and women's empowerment.

Six of eight studies featured in a **2015 special issue** of the *Journal of Development Studies*, "Farm-Level Pathways to Improved Nutritional Status," were coauthored by A4NH-affiliated researchers and used data from Africa and South Asia to systematically test whether household agricultural production has direct links to dietary patterns and nutrition.

These studies built upon past research defining key pathways through which agriculture impacts nutrition, particularly from the 2013 series on maternal and child nutrition in *The Lancet*, with contributions

"HKI is committed to contributing to the evidence base of what program approaches really do make a difference for the lives of the most vulnerable and disadvantaged. Implementing such a complex program as a randomized controlled trial is enormously challenging, but necessary if we want to advance in the fight against malnutrition. In this effort we consider IFPRI a lead organization for quality impact evaluation research and an essential partner."

—Tom van Mourik, Helen Keller International/Senegal

from A4NH researchers. Using a range of data, metrics, and analytical tools, and carried out in a variety of contexts, the studies in this special issue demonstrated direct and important linkages between household agriculture production, household diets, nutritional status, and women's empowerment. They confirmed that household production diversity, or livestock ownership, or both were associated with greater diversity in diets, and in some studies, with reduced stunting in children. This was particularly true where markets were inefficient, and in households where women were more empowered.

Evidence informs better program design

New evidence from an IFPRI-led study in Burkina Faso, the first RCT of its kind, helped fill a critical gap in understanding the impact of an integrated agriculture program on nutrition and empowerment outcomes. Not only did the study show that integrated

agriculture can work (and quickly!), but it also examined delivery methods to gauge whether nutrition and health messages were more effective coming from older women leaders or from health committee members. (It turns out, it's the latter.) Even more exciting, **results from a process evaluation**, conducted while the program was still running, allowed for adjustments mid-course based on recommendations from the research team. The evaluators offered HKI several recommendations on how to enhance the impacts of E-HFP on children's nutritional status, including:

- Adding a fortified complementary food for children 6–24 months of age to meet their high nutritional needs;
- Expanding the behavior change communication (BCC) strategy to emphasize preventing malaria and diarrhea; and
- Adding an intervention to improve water, sanitation, and hygiene (WASH) practices.

HKI adopted all these recommendations in designing a new E-HFP program for Burkina Faso, "Creating Homestead Agriculture for Nutrition and Gender Equity" (CHANGE), which began in 2014. CHANGE features an enhanced model with new components covering improved WASH practices, malaria prevention, and nutrient supplementation for children 6–23 months of age. Together, these components can achieve more than individually. For example, by providing micronutrient-fortified supplements



PHOTO: MAHMUDU HASAN, COURTESY OF PHOTOSHARE

in addition to increasing access to micronutrient-rich foods, the program may further reduce anemia or stunting among participating children. Likewise, improving the prevention of the two most prevalent illnesses (malaria and diarrhea) can also lead to better maternal and child health and nutrition outcomes.

From “what” to “how”

We now have solid evidence on whether agriculture is linked to nutrition and health outcomes (it is!) and whether agriculture can play a direct role in achieving better impacts (it can!). However, the learning has just begun. Now A4NH researchers are experimenting with exactly *how* to do it best. For example, past A4NH research showed us that gender plays a key role in achieving nutrition impact. Now we are exploring a range of approaches and intervention models to foster women’s empowerment within agriculture projects. Several new studies in South Asia, developed by IFPRI and partners in 2015, all pay close attention to women’s empowerment, both as an objective in itself and as a key to improving maternal and child nutrition.

In Bangladesh, the **TRAIN project** uses a rigorous RCT design to test the impact of providing nutrition-sensitive agricultural extension messages and nutrition BCC to both women and men via a well-established agricultural credit program. It examines differences in nutrition and empowerment impacts when interventions include: (1) nutrition BCC alone; (2) nutrition BCC plus nutrition-sensitive agricultural extension messages delivered to women and men; and (3) nutrition BCC plus agricultural extension, male sensitization, and social mobilization. The **ANGeL** pilot project in Bangladesh is generating evidence on how agricultural development can improve nutrition with

potential for national-level scale. It focuses on reducing household-level gender inequities to improve maternal, newborn, and child health and nutrition by providing training in agriculture and nutrition, coupled with BCC for both men and women. In ANGeL, community nutrition workers use a tool developed by HKI to deliver gender-sensitive training on food security, nutrition, asset control, decision making, mobility, and income management, in collaboration with government agricultural extension agents who deliver extension training to both men and women. ANGeL was motivated in part by data from the 2012 Bangladesh Integrated Household Survey, which was the first nationally representative survey to include the Women’s Empowerment in Agriculture Index (WEAI). Analysis of the WEAI data found that 77 percent of rural women in Bangladesh were disempowered, compared to around 56 percent of men. Further analysis showed that women’s empowerment was significantly associated with child, maternal, and household dietary diversity.

Similarly, the new **WINGS** project in India partners with one of the country’s largest NGOs, PRADAN, to study how women’s self-help groups can improve the nutrition of women and children in poor tribal districts in India. The evaluation consists of quantitative panel surveys and process evaluation studies, several experimental studies, and a cost-effectiveness analysis of PRADAN’s self-help group models. The evaluation will investigate the impact of PRADAN’s activities on the nutritional status of women, how participation in PRADAN’s activities affect women’s empowerment, and how women’s empowerment mediates impacts on the nutritional status of women, as well as on the diet quality and nutritional status of children under two years of age.

PHOTO: BIODIVERSITY INTERNATIONAL/E.HERMANOWICZ



Studies like these, supported by A4NH, allow flexibility to test different approaches across a range of contexts to see what works best and what can be replicated elsewhere.

Offering a roadmap for success

While we are building an evidence base and testing new modalities or partnerships for improving nutrition and health, we know that governments, decision makers, and investors still depend on evidence-based guidance to design, fund, and implement effective programs and policies right now. At the core of the 2030 Agenda for Sustainable Development are efforts to support country ownership and performance in achieving the 17 agreed-upon SDGs with an ambitious 15-year target. One resource helping countries do this is the **Global Nutrition Report**, written by an international expert group, including a number of A4NH scientists, supported and convened by IFPRI. While the inaugural GNR 2014 offered a global snapshot of the state of the world’s nutrition to spur action and commitment from countries, GNR 2015 assisted stakeholders in achieving mutual accountability by updating country indicators and progress, and providing options for action that are demonstrated effective in improving nutrition. ■

At IFPRI’s 40th anniversary event in Washington, DC, in November 2015, Bangladesh’s Minister of Agriculture, the honorable Matia Chowdhury, confirmed her country’s commitment to addressing malnutrition, saying,

“Our Ministry of Agriculture is implementing the [ANGeL] project...to gauge the impact of farmers’ income, household food security, women’s empowerment, and child and maternal nutrition. The evidence thus gathered will be used to shape the design of a national program.”



PHOTO: JANE NAUGHTON/IFPRI IMAGES



SPOTLIGHT ON NEW INITIATIVES ///

Improving value chains for vulnerable populations in East Africa

EMERGING MARKETS FOR NUTRITIOUS FOODS typically cater to middle- and high-income consumers. By and large, nutritious foods are developed, produced, distributed, and marketed in ways that do not take into account the economic and social circumstances of the poorest consumers. Across all income groups, there is a growing demand for convenient processed foods, especially among peri-urban and urban populations. Demand is driven by a number of factors including rapid urbanization, rising incomes, shifts in dietary preferences, and the high cost of energy for cooking, and provides new market opportunities for small and medium enterprises (SMEs).

CIAT is leading a new project—Making Value Chains Work for Food and Nutrition Security of Vulnerable Populations in East Africa—looking at how market-based solutions can be designed to improve the diets of vulnerable consumers, specifically women of reproductive age and children under five years of age in peri-urban and urban areas of Kenya and Uganda. The three-year project is funded by BMZ with financial support from A4NH.

The research team is convening multistakeholder platforms to test interventions for improving private sector involvement

in linking agricultural production to increased consumption of affordable, safe, nutrient-dense foods. For example, one intervention will focus on working with an SME to develop a bean-based porridge that is nutrient dense, affordable, and ideal as a complementary food for young children. While a family may not have the resources to cook dry beans, vegetables, and cereals three times a day, they can boil a porridge in 10 minutes that contains products from multiple food groups.

Partners in the project include the **Pan African Bean Research Alliance**, an international network of national agricultural research systems in 30 countries with more than 350 partner organizations, working in cooperation with at least 50 million farming households together with rural community organizations, NGOs, and the private sector. Other critical research partners are the University of Goettingen, University of Hohenheim, Kenya Agricultural and Livestock Research Organization, and Uganda's National Agricultural Research Organization.

The project builds on **A4NH-funded work at CIAT** on beans and amaranth in Kenya and Uganda. It is one of many A4NH projects applying the **value chains for nutrition framework**. ■

Building a platform to cultivate agriculture-nutrition research capacity

A4NH IS FOSTERING A GLOBAL COMMUNITY of interdisciplinary researchers working on agriculture and food systems for improved nutrition and health through the **Agriculture, Nutrition, and Health Academy** (ANH Academy), which officially launched in June 2015. The ANH Academy is open to any researcher working at the intersection of agriculture and food systems, nutrition and/or health. Membership is free of charge. Along with the Leverhulme Centre for Integrative Research on Agriculture and Health (LCIRAH) and the DFID-funded IMMUNA research initiative, A4NH founded the Academy and

has provided initial coordination with an open invitation for new partnerships to support Academy activities.

The Academy's four objectives are to: share innovative research in agriculture and food systems for improved nutrition and health; stimulate the development and harmonization of new research; help strengthen the capacity of the research community to undertake intersectoral and interdisciplinary research; and facilitate the uptake of robust evidence in policies and programming in agriculture and food systems for improved nutrition and health.



The Academy will achieve these goals through five main activities. Members are welcome to join any of the Academy's active technical and policy working groups, which currently include Sustainable Diets, Food Environments, and Food Safety. By synthesizing experience on various aspects of using methods and metrics in agriculture for nutrition and health research, these groups help accelerate research on measuring impacts of agriculture and food system change. The first annual ANH Academy Week research conference is taking place in Addis Ababa over five days in June 2016. The event will kick off with two days of Learning Labs, training sessions covering a broad range of impact measurement methods and

skills, and sessions on interdisciplinary research, gender-sensitive interventions, and getting published, among others. This will be followed by a three-day research conference. The ANH Academy Week will become one of the Academy's major annual events. Other activities include online and face-to-face seminars, workshops, and training opportunities plus an online collaborative platform.

As of December 2015, just six months after its launch, the Academy had 305 members. The majority (about 60 percent) are junior or mid-level scientists and 43 percent come from countries in Africa south of the Sahara or South Asia. To join the Academy, visit their website: ANH-Academy.org.

Delivering results to tackle aflatoxins

ONE OF A4NH'S PRIORITIES is exploring how to mitigate and control aflatoxin contamination, particularly in hotspot areas in Africa south of the Sahara. Aflatoxins are carcinogens produced by some species of *Aspergillus* fungi, most commonly found in maize and groundnuts. There are harmful health consequences for consumers who eat contaminated foods and for producers whose livelihoods are compromised when their grain becomes contaminated before it is sold. For over a decade, IITA has worked closely with the United States Department of Agriculture (USDA) to develop nationally tailored versions of aflasafe™, a biocontrol product that consistently reduces aflatoxin levels on maize and groundnuts by 80 to 99 percent. Focused aflatoxin biocontrol research in Africa first started in Nigeria where aflasafe™ is today a fully registered product for commercial use. The product in Kenya is also fully registered by the Kenyan biopesticide regulator Pest Control Products Board. Currently, products are ready to enter the regulatory approval process in Burkina Faso, Senegal, and the Gambia.

In 2015, IITA received five-year grant funding from the BMGF to scale up the use of aflasafe™ by facilitating transfer of the technology to private sector manufacturers and distributors, or where appropriate, to governments in order for the

product to be widely adopted by smallholder farmers in 11 countries in Africa. There are many unanswered, difficult questions for the scale-up of aflasafe™, such as what entities should run the manufacturing plants and what market should be targeted—solely for the public sector or should they competitively sell aflasafe™ commercially, for example. The grant will support the IITA team so they can approach these questions methodically and strategically, and work with government and commercial partners to ensure smallholders reap the maximum benefit possible.

Within 18 months of the project's start, the IITA team is committing to being able to demonstrate that aflasafe™ is protecting a cumulative 100,000 hectares of maize and groundnut across Nigeria, Kenya, and Senegal. The five-year goal is to cover 500,000 hectares.



Gender

Women and men both have important roles to play in achieving good health and nutrition outcomes, as agricultural producers and income earners. In many places, women are more likely to have additional roles as caregivers and food providers to their children and other household members. While important and useful evidence has been generated on the role of women in agriculture-nutrition-health pathways, it is not enough to focus solely on women—they must also be viewed in the context of their relationships with men.

A4NH research pays particular attention to gender with an aim of filling evidence gaps in the framework that traces the links from agriculture to nutrition and health. Our research examines the impact of gender-based differences on nutrition and health outcomes, improving nutrition through **increasing women's assets**, control over income and **decision making**, and **empowering women** to make decisions that improve family health and nutrition—all while avoiding unintended consequences of agricultural development for women's

"In the Indian context, agriculture is a critical pathway to addressing undernutrition. A majority of the Indian population rely on agriculture for their livelihoods. In rural areas, 70–80 percent of women depend on it. So agricultural growth can have impacts on livelihoods, food prices, and even women's empowerment—all of which can improve nutrition."

—S. Mahendra Dev, Director and Vice Chancellor, Indira Gandhi Institute for Development Research, Mumbai, India; A4NH Independent Advisory Committee member; IFPRI Board Member

well-being and empowerment. A4NH research is also starting to consider how men can be engaged in nutrition and health, and how youth, especially adolescent girls, can be better targeted.

An evolving gender portfolio

In 2015, an external evaluation of A4NH noted that "very good progress" had been made on gender issues in the first phase of the program. To improve our attention to equity issues within A4NH, the A4NH gender team is being renamed the Gender, Equity, and Empowerment Unit moving forward. The **A4NH Gender Strategy** was updated in 2015 to reflect this change, and its focus was broadened to increase attention to health outcomes. A theory of change was developed to show how gender-responsive research and gender-based capacity building activities within A4NH will lead to desired development outcomes of increased empowerment of poor women.

Based on feedback from the 2013 gender-nutrition methods workshop, A4NH pursued research on women's time use in agriculture and the impacts on nutrition. In 2015, in collaboration with its research partner, LCIRAH, A4NH published a **systematic review** on agriculture, gendered time use, and nutrition, which found that women spend a large amount of time on agricultural activities, and that agricultural interventions tend to increase demands on their time and detract from other important activities, such as rest, food preparation, and childcare. Key findings were presented at a **policy seminar** held at the IFPRI headquarters in May 2015 and also disseminated through **blog posts** and a **video on the A4NH Vimeo channel**. A **side event** was also organized at the 5th annual LCIRAH conference on women's time allocation, agriculture, and nutrition. Consistent with the findings of this report, a cross-country analysis of time-use and

nutrition data undertaken by A4NH gender researchers found a link between asset ownership and time use, and trade-offs between time spent in agriculture and diet quality.

The second round of the Gender, Agriculture, and Assets Program (GAAP2) officially started in 2015. GAAP2 will adapt and validate an indicator which agricultural development projects can use to monitor project outcomes related to women's empowerment. GAAP2 will also develop a community





of practice which will first be opened to participating projects, and eventually to a wider community, including researchers from A4NH as well as other CGIAR Centers. GAAP2 is funded by BMGF, with financial support from A4NH.

In 2015, the A4NH-hosted Gender-Nutrition Idea Exchange continued to thrive, experiencing a growing readership of 72 percent more sessions since it launched in 2014. The blog covered new topics such as the relationship between nutrition and time use in agriculture, the health impacts of agricultural interventions, new indicators of diet diversity for women, and the interaction of climate change with gender-nutrition pathways.

A4NH strengthened its gender capacity in 2015 by hiring two gender postdoctoral fellows through the CGIAR Gender Postdoctoral Fellowship Award, who are supporting cross-CRP gender work within A4NH and the CRPs on Livestock and Fish, Grain Legumes, and Policies, Institutions, and Markets.

Gender-related findings from A4NH-supported research studies in 2015 provided new evidence. A study on gendered differences in crop choice in Mozambique showed that women are more likely to grow crops that do not require complicated production techniques and are less likely to grow the main cash crop of the area. In Vietnam, a qualitative study found that agricultural innovations and related socioeconomic changes have brought about changes in the gendered division of labor, but power dynamics within the household still remain unbalanced. In Ghana, research found that women's empowerment is positively correlated with infant and young child feeding practices, but not with nutritional status. A review of 20 informal fish and livestock value chains shows that gender-based differences in occupational exposure and in consumption patterns are determinants of differences in health risks between men and women.

Expanding gender integration

In 2016, gender research in A4NH will explore strategic areas such as the relationship between women's energy expenditure in agriculture and their nutrition outcomes, dimensions of empowerment in agriculture, the gendered impacts of value-chain interventions on nutrition, and the role of gender in nutrition-sensitive school feeding programs.

Research under GAAP2 will commence in 2016 with an inception workshop for the selected projects from South Asia and Africa south of the Sahara that will be part of the portfolio. In addition to A4NH projects, such as ANGeL, WINGS, and TRAIN, the portfolio also includes projects such as a resilience-building project in Burkina Faso, a small-scale irrigation and women's empowerment project in Ghana, and an evaluation of a women's food security program for poor Maasai households, among others. The implementers range from development organizations, such as Catholic Relief Services, BRAC, and PRADAN, to FAO, IFAD, UNWomen, and WFP. The selected agricultural development projects will start collecting baseline data, with support from the GAAP2 team to use quantitative and qualitative approaches to validate the project-level Women's Empowerment in Agriculture Index (pro-WEAI), which is a lighter version of the WEAI, and to identify which strategies work to empower women in agricultural development programs.

Several more new A4NH projects integrate gender in their research design and analysis. A research study in East Africa, led by ILRI with funding from IMMANA, will develop new metrics for women's empowerment relevant to a variety of livestock value chains to analyze the pathways through which livestock interventions can impact women's empowerment and child nutrition. A multi-country project, led by Bioversity International and partners, will explore whether the development and promotion of underutilized crops contributes to women's increased control over income, group membership, leadership, and participation, and reduced time use in post-harvest processing activities. ■

"A4NH is a fantastic research initiative targeting real issues affecting resource-poor communities of the developing world in order to improve their health through good agricultural practices."

—Professor Samson Mukaratirwa, University of KwaZulu-Natal, South Africa, participant in regional public health consultations convened by A4NH, 2015



The Evolution of A4NH

2015 has been a year of planning for A4NH—building on lessons from our first three years and guided by the Agenda for Sustainable Development and new CGIAR SRF. Consultations convened with partners on food systems, nutrition-sensitive agriculture, and agriculture-public health also provided insights that have been integrated into the A4NH proposal for implementation in 2017–2022 (submitted in March 2016).

Linking A4NH research to sustainable development

Connections among equity and empowerment, agriculture and food, and health, which are the focus of A4NH research, are central to the new SDGs, particularly the two goals focused on nutrition and health. The SDGs are grounded in and reinforce the role of country ownership and accountability for development. A4NH is making two changes to better support the SDG process.

- ① Take on broader equity and empowerment considerations in the context of our focus on improving nutrition and health outcomes and expand the emphasis on healthy diets with support from experts on sustainable diets.
- ② Prioritize research that supports country leadership, capacity, and performance for healthier food systems and more effective public policies and programs. A4NH will focus its country-level engagement in five countries—Bangladesh, Ethiopia, India, Nigeria, and Vietnam.

The increased emphasis on nutrition and health in CGIAR's new SRF will highlight A4NH's work, particularly its integrating role for the CGIAR goal on food and nutrition security for health. From 2017, we will build on our existing collaboration platforms, such as the gender-nutrition information exchange, to engage CGIAR partners in national food system platforms and in networking with nutrition and health partners. While the emphasis on undernutrition will continue, our research will also look at emerging health challenges linked to agrifood systems; the epidemic of obesity and diet-associated noncommunicable diseases; the growing burden of foodborne disease; and antimicrobial resistance associated with animal agriculture.

Learning lessons and building on successes from the first three years of A4NH (2012–2014)

A4NH's leadership on nutrition and health in CGIAR was recognized by an **external evaluation** commissioned to provide recommendations on future directions. The evaluators also commended the relevance of the A4NH research agenda, the quality of researchers, and progress made in delivering

high-quality outputs. Recommendations from the external evaluation panel contributed to three important adjustments to the A4NH agenda.

- ① Refining the core research agenda and distinguishing this from the role of A4NH in integrating and adding value to CGIAR research more broadly.
- ② Jointly managing human resources, research quality, ethics, resource mobilization, and country partnerships with others. Six designated A4NH Managing Partners will have responsibility for co-managing A4NH with the Lead Center, IFPRI.
- ③ Strengthening cross-cutting research—particularly research on equity and on monitoring, evaluation, and learning. A4NH will create cross-cutting units for Gender, Equity, and Empowerment; Monitoring, Evaluation, and Learning; and Country Coordination and Engagement.

New directions

Two of the flagships in A4NH, **Biofortification** and **Integrated Programs and Policies**, have mature and high-performing research portfolios, which will continue to evolve. For Biofortification, initial proof-of-concept research has demonstrated both efficacy and potential for scalability. Future efforts will focus on delivery and learning about delivery at scale in nine target countries and beyond. For Integrated Programs and Policies, important evidence on agricultural pathways and enabling country performance for improving nutrition has been generated. While additional research on *what* program interventions and policy actions is needed, going forward, emphasis will move toward looking at *how* programs are implemented and enabling policies and investments are made.

More significant changes are planned for the other two A4NH flagships, **Value Chains for Enhanced Nutrition** (VCN) and **Agriculture-Associated Diseases** (AAD). Currently, VCN focuses on improvements to value chains for nutrition-dense



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PHOTO: AAKASH KOIRALA/BIOVERSITY INTERNATIONAL

foods—animal-source, fruits and vegetables, and pulses. In future, we will support other agrifood CRPs in making their value-chain research more nutrition-sensitive. A new A4NH flagship, **Food Systems for Healthier Diets**, will emphasize assessment of diet quality and consumption trends and focus on systemic innovations, scaling up, and anchoring of food systems in four focus countries (Bangladesh, Ethiopia, Nigeria, and Vietnam). Set to begin in 2017, this new flagship will be led by Wageningen University and Research Centre and will give private sector actors a bigger role, with the Global Alliance for Improved Nutrition playing an important convening role.

Health has a prominent place in CGIAR's new SRF, including two high-level development outcomes: **Food Safety** and

Improving Human Health. From 2017, each will be a flagship in A4NH. Managing food safety in informal markets in developing countries will be essential to achieving both nutrition and health goals. The new Improving Human Health flagship will take a new partnership approach, being led jointly by agriculture researchers (ILRI) and public health researchers (a consortium led by the London School of Hygiene and Tropical Medicine). This flagship will combine ongoing agriculture-health research, such as One Health and EcoHealth approaches to zoonoses and vector-borne disease control, with urgently needed joint research to reduce global human health threats of emerging diseases and antimicrobial resistance associated with animal agriculture. ■

Financial Summary

Since its beginning, most financing for A4NH research has been through grants. In 2015, reliance on grants increased (from 70 to 80 percent of overall funding) and funding from the CGIAR Fund was substantially reduced (by approximately one-third). Almost all CGIAR Fund support comes from a group of funders who directly support A4NH.

The increasing requirements for securing grant funding are not unusual for research programs, and the additional effort in writing grant proposals and funding volatility are part of

modern research management. The immediate impact of reductions in CGIAR Funds has been much larger for the A4NH flagships with early-stage research, such as Value Chains for Enhanced Nutrition and Agriculture-Associated Diseases. Reductions in revenue from the CGIAR Fund will be even greater in 2016. From 2017 onward, the base budget from the CGIAR Fund is expected to improve relative to 2016, given the prominence of nutrition and health issues in the new CGIAR SRF and the success of A4NH to date. ■

The CGIAR Research Program on Agriculture for Nutrition and Health Cumulative and Annual Expenditure (2012–2015) in USD Thousands

Program Components	2012–2015 Cumulative Expenditure		2015 Total Expenditure	
	CGIAR Fund	Grants	CGIAR Fund	Grants
Flagship 1: Value Chains for Enhanced Nutrition	10,628.21	12,661.45	2,514.71	2,768.00
Flagship 2: Biofortification	31,515.82	115,930.96	6,550.82	53,976.00
Flagship 3: Agriculture-Associated Diseases	19,688.36	23,056.37	4,617.36	5,939.00
Flagship 4: Integrated Programs and Policies	11,661.37	44,033.54	3,215.37	11,745.32
Management/Coordination Total	6,631.27		1,968.27	
Total	80,125.02	195,682.32	18,866.52	74,428.32

Donors

African Union—InterAfrican Bureau for Animal Resources (AU-IBAR)
 Australian Centre for International Agricultural Research (ACIAR)
 Austrian Development Agency
 Bill & Melinda Gates Foundation (BMGF)
 * Bioversity International CGIAR Fund
 Children's Investment Fund Foundation (CIFF)
 Common Fund for Commodity (CFC)
 Concern Worldwide
 Daniel and Nina Carasso Foundation
 * Deloitte Consulting LLP
 Economic Empowerment of the Poor/Stimulating Household Improvements Resulting in Economic Empowerment (EEP/Shiree)
 * Family Health International
 Food and Agriculture Organization of the United Nations (FAO)
 Food and Agricultural Organization of the United Nations /Global Environment Facility (FAO/GEF)

Germany GIZ
 Global Affairs Canada
 Global Alliance for Improved Nutrition (GAIN)
 Government of The Netherlands
 * Imperial College
 Institute of Development Studies (IDS)
 * International Center for Tropical Agriculture (CIAT)
 International Development Research Centre (IDRC)
 * International Food Policy Research Institute (IFPRI)
 International Fund for Agricultural Development (IFAD)
 International Initiative for Impact Evaluation (3ie)
 * International Potato Center (CIP)
 Irish Aid
 * Liverpool School of Tropical Medicine (LSTM)
 * London School of Economics and Political Science
 * London School of Hygiene & Tropical Medicine

* Malaria Research and Training Center, University of Sciences, Techniques, and Technologies of Bamako (MRTC/USTTB)
 * McGill University
 McKnight Foundation
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CGIAR Partners

A4NH's progress toward its goals would not be possible without the following CGIAR Partner Centers, in addition to countless other non-CGIAR collaborators:



Governance

A4NH is grateful for the committed individuals mentioned below who provide the program with everything from strategic guidance and planning and monitoring oversight, to input on performance and new directions, as well as day-to-day management. Together, these management and governance bodies help ensure A4NH's continued success.

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PHOTO: RAJAT KUMAR DAS

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[‡] A4NH is deeply saddened at the passing of Dr. Mahabub Hossain on January 4, 2016.

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About the CGIAR Research Program on Agriculture for Nutrition and Health

The CGIAR Research Program on Agriculture for Nutrition and Health (A4NH) aims to maximize the health and nutritional benefits of agricultural development. A4NH's research outputs are intended to support agricultural researchers, value-chain actors, program implementers, and policy makers in reshaping their actions to better contribute to nutrition and health outcomes and impacts. The program also aims to identify, develop, and support synergies between agriculture and the nutrition and health sectors to maximize the benefits and minimize the risks of agricultural actions to human nutrition and health.

The program draws on expertise from 12 CGIAR Centers as well as partners from across the agriculture, nutrition, and health sectors, collaborating on new research and developing joint solutions to reduce the global burden of malnutrition and disease. This program is led by the International Food Policy Research Institute.

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