On the Path ^{to} Better Nutrition & Health

A4NH 2012 Annual Report

RESEARCH
PROGRAM ON
Agriculture for
Nutrition
and Health

Led by IFPRI

In its first year, A4NH took many steps to lay the groundwork for improved global health and nutrition in the future. Our initial work focused on solidifying critical partnerships, establishing a management structure that will provide external guidance and advice, developing our partnership and gender strategies, and planning for exciting new research initiatives in our four program areas. Besides establishing a coordinated governance and oversight structure, many A4NH research programs were already underway in 2012, particularly those focusing on biofortification, sustainable diets, and agriculture-associated diseases.

In 2012, the HarvestPlus program released four biofortified crops: high-iron beans in Rwanda, high-iron pearl millet in India, vitamin A maize in Zambia and Nigeria, and vitamin A cassava in Nigeria, while new evidence indicated that vitamin A-fortified orange sweet potato had improved nutrition in women and children in Uganda. Through A4NH, HarvestPlus expanded into Latin America and the Caribbean. Also in 2012, A4NH expanded its nutrition-outcome portfolio through evaluations with the Poverty, Health, and Nutrition Division of IFPRI and other implementing partners.

2012 Highlights

- January** A4NH launched, research priorities finalized, and theme leaders appointed for each research area.
- > Theme Leader for **Value Chains for Enhanced Nutrition**: Laurian Unnevehr
 - > Theme Leader for **Biofortification**: Howarth Bouis
 - > Theme Leader for **Agriculture-Associated Diseases**: Delia Grace
 - > Theme Leader for **Integrated Programs and Policies**: Marie Ruel
- February** A4NH held inaugural Planning and Management Committee (PMC) and Center Focal Point (CFP) meetings to establish the research program's management structure, clarify its management deliverables, and discuss its research agenda.
- June** The International Livestock Research Institute (ILRI), an A4NH partner, released a DFID-funded report on zoonoses and poverty.
- August** Another A4NH partner, Bioversity International, co-published a book with the Food and Agriculture Organization of the United Nations (FAO) called *Sustainable Diets and Biodiversity: Directions and Solutions for Policy, Research and Action*.
- October** A4NH collaborated on two workshops, which covered agriculture for nutritional outcomes and gender and nutrition, to prepare for the 2nd Global Conference on Agricultural Research for Development. At the conference, A4NH Director John McDermott presented a parallel session on household nutrition security.
- November** The first Independent Advisory Committee (IAC) meeting was held in Washington, DC, to formally introduce A4NH, initiate program planning activities, and generate recommendations on partnership, gender, and engagement strategies.
- December** The CGIAR Consortium approved A4NH's gender strategy, which will prioritize gender research across our portfolio (See more on gender strategy on page 20).

Why A4NH?

Farmers are growing more food than ever before. Global food production delivers one-third more calories than the minimum amount we need each day. Yet we do not all enjoy healthy diets. Approximately 165 million children under the age of five suffer from chronic malnutrition. It's clear that agricultural growth has helped feed more people, but it has not succeeded in nourishing everyone. Two especially neglected groups are women and young children, who need nutritious food the most.

The poor are especially vulnerable. Poor diets and related micro-nutrient deficiencies pose the most pressing nutritional problem faced they face. Diseases that are food borne and zoonotic—those which jump from animals to humans—both disproportionately affect the poor. Furthermore, when agricultural production is intensified, more food-safety risks surface. More food has not always translated into better health and nutrition for at-risk people.

To address the disconnects between increased agricultural production and health and nutrition, the research program on Agriculture for Nutrition and Health (A4NH) was created, led by the International Food Policy Research Institute (IFPRI). As part of CGIAR, a global research partnership for a food secure future, we seek to explicitly link agriculture to improved health and nutrition. A key question guides all of our work: How can we ensure that agri-

cultural practices, interventions, and policies will maximize health and nutrition benefits while reducing health risks?

To answer that question, we aim to conduct research and build capacity to integrate nutrition and health concerns into the research of CGIAR centers collaborating with hundreds of partners. To achieve this goal on a broader scale, A4NH brings together research and development professionals across the agriculture, nutrition, and health sectors and encourages them to step away from their silos, so that they can do something unusual: jointly tackle global hunger and malnutrition and develop shared solutions.

Our program focuses on four themes:

1. **Value Chains for Enhanced Nutrition, page 4**
2. **Biofortification, page 8**
3. **Agriculture-Associated Diseases, page 12**
4. **Integrated Programs and Policies, page 16**

Through a collaborative, results-oriented approach, A4NH finds synergies among research areas, coordinates partnerships across the public and private sectors, and facilitates more systematic approaches to learning and evaluation. Tackling such a complex problem as malnutrition in a way that makes the greatest difference for those who need it most requires input from partners across many sectors.

A4NH Strategic Goal

A4NH works to accelerate progress in improving the nutrition and health of poor people by identifying, developing, and supporting synergies among agriculture, nutrition, and health. This work is organized into four key research themes: value chains, biofortification, control of agriculture-associated diseases, and integrated programs and policies. Our main users include value chain actors (ranging from producers to consumers and including public and private sectors); development program implementers (communities, civil society, government, and NGOs); and policymakers, investors, and intergovernmental agencies.

OUTPUTS

- > Research (knowledge, technology, evidence)
- > Capacity (improvements in knowledge, attitudes, skills, behaviors)
- > Engagement (advocacy and collaboration based on evidence and systematic learning)

MEDIUM-TERM OUTCOMES

- > Value chains that deliver safe and nutritious food
- > Integrated agriculture, nutrition, and health programs for more nourished and healthy people
- > Cross-sectoral policies and investments that improve nutrition and health

ULTIMATE IMPACT

- > Improved nutrition and health, especially among women and young children

Message from IFPRI's Director General

Dear Friends, Colleagues, and Supporters of A4NH:

The CGIAR Research Program on Agriculture for Nutrition and Health was launched in January 2012. I warmly thank John McDermott, the director of A4NH, for designing the program's strong strategic focus, developing innovative partnerships that bridge the three sectors, and planning intermediate development outcomes that will lead to impact.

Malnutrition and the resulting human health costs, particularly for women and children, remain significant problems in many countries. Correspondingly, illness caused by unsafe foods has enormous impacts on the health and livelihoods of people around the globe. Agriculture, as a source of food and income and as an engine of growth, has the potential to significantly and sustainably improve poor people's nutrition and health. A4NH is designed to do just this by conducting research, strengthening capacity and developing partnerships focused on how agricultural practices, interventions, and policies can be better adapted and redesigned to maximize health and nutrition benefits and to reduce health risks.

CGIAR's new strategy and results framework includes, for the first time, better nutrition and health as a key priority – one of its four system-level objectives. A4NH is synergistically building on the existing strengths of IFPRI's research, especially in its Poverty, Health, and Nutrition Division, on the HarvestPlus program, and on the programs of partner CGIAR Centers and other partners.

As the lead Center, IFPRI is committed to support A4NH. We provide intellectual and technical inputs into the program's strategic direction. We mobilize bilateral funding to complement the contributions from the CGIAR Fund. We provide financial tracking to ensure transparent, accurate accounting of donor support and to verify that the funding is spent according to CGIAR-approved plans. We benefit from our interaction with the A4NH team at IFPRI, and are pleased to serve as the Lead Center.

We look forward to continuing to support A4NH as it, together with its partners, implements its exciting research agenda.

Sincerely,

Shenggen Fan

Director General, International Food Policy Research Institute (IFPRI)

Message from A4NH's Program Director

Improving the nutrition and health of poor people, particularly women and young children, is an economic and social imperative. In the past, many assumed that producing food was all agriculture had to do to nourish people. However, we now know that agriculture does not necessarily improve health and nutrition. In fact, some agricultural interventions not only do not improve nutrition and health, they make them worse. Agriculture and food system intensification, which involves the use of more inputs (such as land or water), more intensive management, or more complex value chains (such as large-scale processing of outputs from multiple farms), can increase the risks of unsafe food and infectious diseases. But it doesn't have to be that way.

The goal of the A4NH program is to help agriculture do more to improve human nutrition and health and to mitigate health risks from agriculture. On nutrition and health issues, agricultural research needs to move from proclamation to evidence and action that improves health and nutrition.

All of you will agree that this is an important goal. And a CGIAR research program is well-positioned to reach that goal. In 2011, researchers for CGIAR projects and programs were already working on biofortification; evaluating programs for nutrition outcomes, food safety and zoonoses; and working to enhance nutrition or mitigate health risks associated with specific agriculture and biodiversity interventions.

We envision A4NH moving toward its goal in two phases. First, we bring together a critical mass of researchers, development implementers, and enablers to tackle complex cross-sectoral problems with innovative approaches. Second, we strengthen and systematize how we look at the behavioral and other changes needed to improve health and nutrition. In the coming year, we will work with our partners to develop and refine a theory of change and impact pathways in order to achieve our overarching goal of improved nutrition and health for women and young children. Our work during these two phases can build on the success of our strong research teams by tackling important research gaps and building new partnerships for improving nutrition and health outcomes.

In 2012, our first year, we made significant progress. We established and implemented key program governance, advisory, and management relationships. We reached out to partners to expand and build new partnerships. Through our research and implementing partners, we also made strides in several areas of our research portfolio. In partnership with the International Livestock Research Institute (ILRI) and with support from the UK Department for International Development (DFID), we released a new report, mapping poverty and likely zoonoses hotspots to help guide future zoonoses-response priorities. By the end of 2012, the HarvestPlus program had fully deployed four biofortified crops to address micronutrient deficiencies. We expanded our nutrition-outcome portfolio, working with implementers to evaluate programs and gather evidence to improve service delivery, linking these initiatives to partnership platforms, such as Transform Nutrition, to help translate research evidence into improved nutrition practices. We have been working systematically on enhancing our partnerships and you will hear from some of our partners later in this report. We also invested in some key ingredients for innovation and impact, most notably by developing A4NH's gender strategy.

A4NH is an exciting new initiative. We look forward to working with you.

John McDermott

Director, CGIAR Research Program on Agriculture for Nutrition and Health

Value Chains for Enhanced Nutrition

Undernutrition, which refers to deficiencies in energy, protein, or essential vitamins and minerals, is associated with 45 percent of child deaths.

Theme 1 focuses on opportunities to improve food safety and nutrition along select value chains to increase demand for, access to, and consumption of affordable nutritious foods among poor households, with a focus on vulnerable women, infants, and young children. A value chain is a linked set of activities that brings a product from conception and production to delivery to the final consumers. Studying them helps identify both barriers to participation that specific groups face and bottlenecks that limit growth.

A healthy diet includes nutrient-rich foods which can include fruits, vegetables, animal-source foods, and biofortified or fortified staples. Diets without diversity or adequate nutritional intake can lead to deficiencies in micronutrients such as vitamin A, iron, and zinc, which affect physical and cognitive development and may increase a person's risk of chronic disease. Factors such as limited availability, economic constraints, and lack of knowledge and information prevent many poor households from accessing these types of foods. Yet increases in income do not necessarily lead to improvements in diet, given the complexities surrounding the supply of and demand for healthy food.

“Combining agriculture, nutrition, and health care interventions can **reduce stunting and improve women’s lives**. Our partnership with A4NH will enable us to develop and implement better programs by sharing knowledge, experience, and evidence for improved nutrition and health in developing countries.”

— Dr. Kaosar Afsana
Director, Health, Nutrition & Population
BRAC

A4NH draws from existing CGIAR and partner research to identify points along value chains where innovative nutrition interventions can be incorporated to stimulate both the supply of and demand for nutritious foods. Knowledge about how markets, price policies, and agricultural research investments shape diet quality, and ultimately nutrition, is still limited. Research in this area focuses on identifying several key points:

- The value chain development needed to support improved diet quality
- The most effective methods for informing and motivating changes in diet quality
- The public investments and price policies needed to support nutrient-rich food production and consumption

Value Chains to Help Farmers Meet Demand for Safe, Nutritious Food

The most nutritious foods, such as animal-source foods and fresh vegetables, are often the least safe. Many serious food safety risks can originate on the farm but can also increase along the value chain, from production to transport to retail. Nutritional content may also erode during all stages of a value chain, from field to stomach. For nutritious foods to reach those who need them the most, food must stay safe and nutrient-rich during its journey along a value chain—a research area that A4NH has already begun to target this past year.

What would it take to help producers meet the growing demand for more nutritious food? Demand for more safe, high-quality food is on the rise, with more people buying food from retailers instead of (or in addition to) growing and consuming their own crops. This shift presents an opportunity for smallholder farmers—especially women—to participate in modern value chains and help meet growing demand. When poor smallholders link to markets, not only can their incomes and quality of life improve, so can the health and nutrition of producers and consumers along the value chain.

That is where A4NH comes in. A4NH research is helping to determine how poor farmers and other value chain actors

can provide safe, high-quality products to support their own nutrition and that of other populations linked to their value chains. With the help of collaborators, including other CGIAR research programs that work on value chain development, A4NH adds value by improving nutrition and food safety. In 2012, A4NH mobilized its partners to identify agriculture, nutrition, and health research that could improve health and nutrition for target populations, such as women and children, by looking at nutritional quality and food safety in value chains in different ways.

What do smallholders need to thrive in modern value chains? First, from an economic perspective, smallholders need the right incentives and support to make participation in value chains worth their while. When these conditions are right, smallholders can earn more income from safer and higher-quality products. In some cases, helping farmers produce and market high-value commodities could increase returns and offer long-term competitive advantages.

Here's how this could work. Consider, for example, a group of female dairy producers in Bangladesh who produce on a very small scale, are limited to informal markets, and rarely reap

the benefits of dairy demand. Some agricultural development programs introduce them to higher-producing cattle, support their ownership of these valuable assets, help them gain the skills they need to feed and care for their cows, and link them to other producers, collectors, and processors. In some cases, other research and development partners may help these women dairy farmers retain control over the milk their cattle produce and the income earned. Research under A4NH adds further value to such interventions in two ways. First, it provides information that can assure appropriate quality and safety standards for specific markets, like milk, as well as the capacity for women farmers and market agents to participate and build their capacity to fairly compete. Second, targeted research can help women understand the trade-offs involved in selling milk versus retaining it to feed their children and in balancing their work demands with family care so as to support better nutrition outcomes for themselves and their children.

In developed countries, consumer demand for safe food results in high food-safety standards for retailers and producers. In developing countries, such demand also exists but poor producers and consumers are juggling many risks. They need a risk-based management approach that provides incentives and supports their capacity to improve the food safety of their products. For the dairy producers and consumers in Bangladesh and elsewhere, if milk is produced and consumed locally, enhancing food safety may only require fairly simple and easy-to-adopt changes, such as washing hands, cleaning the milking area, or switching from plastic to metal storage containers. As value chains lengthen and get more complex, however, these measures may be inadequate. A4NH research in food safety risk-reduction focuses on taking a pro-poor perspective to food safety and adapting processes as value chains evolve.

In the past year, new A4NH research began building on previous research on risk-based approaches. These approaches include ensuring milk safety, testing interventions to improve household nutrition, particularly for women and children in pastoral areas of Senegal, and focusing on the behavior of milk and vegetable consumers in India. Efforts to enhance nutritional quality and safety have also expanded to research on other value chains and agricultural initiatives, including animal-source food value chains in Africa and Asia (with ILRI and WorldFish collaborating), an assessment of social enterprises for yogurt in Bangladesh (with ILRI and IDS), mango value chains in Africa and Latin America (with ICRAF and Bioversity), identifying complementary foods from dried fish (with WorldFish) and vegetable value chains in Bangladesh (with AVRDC). All of this value chain research builds a foundation for targeted A4NH interventions to reduce health risks and improve nutrition for women, children, and their communities. Initial results will be reported next year.

Biofortification

More than one-third of preschool-age children globally are vitamin A deficient, a condition which is a leading cause of preventable blindness in children.

Theme 2 addresses an underlying cause of malnutrition: “hidden hunger,” or micronutrient malnutrition. Breeding staple crop varieties with enhanced levels of bioavailable nutrients (a process called biofortification) can readily improve nutrition for millions of people through familiar, commonly consumed foods. Given that the diets of undernourished people consist primarily of a few staple foods, A4NH is improving the availability of, access to, and intake of nutrient-rich, biofortified staple foods among the poor by developing, testing, and disseminating seeds, particularly among the most at-risk populations. Boosting production and consumption of biofortified staple foods increases intake of iron, zinc, and vitamin A among malnourished populations and reduces the prevalence of nutrient deficiencies.

Through the HarvestPlus program, established in 2003, biofortification research has produced promising varieties of seven nutrient-rich staple crops, including orange-fleshed sweet potato and vitamin A cassava. HarvestPlus has evolved and strengthened after years of engaging with decisionmakers, testing and validating desired nutrient levels, working alongside farmers in target countries to ensure production viability, and eventually, releasing the biofortified crops to at-risk populations in Africa and South Asia. In its next phase, HarvestPlus is continuing to distribute and promote biofortified crops and conducting market feasibility studies to prepare for scaling up distribution in eight target countries.

“Through our partnership with A4NH we were able to expand the “food basket” approach to **biofortify the main staple crops** that form the diets of vulnerable populations in Latin America and the Caribbean and then share these technologies worldwide.”

— Marília Nutti
Manager, Latin America & Caribbean
Embrapa Food Technology

From Evidence to Scale

Years after getting started in 2003, HarvestPlus is seeing increased success as it prepares to bring biofortified crops to scale in target countries where micronutrient deficiencies are most severe. HarvestPlus is also expanding its reach into Latin America and the Caribbean through new collaboration with A4NH. Through years of development and growth, HarvestPlus continues to demonstrate that biofortification offers many advantages as a solution to combating malnourishment.

Targeted: Biofortification reaches rural communities often missed by other nutrition interventions such as supplementation and fortification.

Cost-effective: One up-front investment is all it takes to breed the nutrient into a crop variety. These crops can then be planted year after year.

Sustainable: Biofortification uses staple foods that people already eat regularly. Farmers can also save and share these nutritious seeds and stem cuttings freely with their neighbors.

Scaling Up a Biofortified Crop Portfolio

Imagine a future where no child suffers from micronutrient deficiencies. A key to making this vision a reality is biofortified crops, which can reduce deficiencies in critical vitamins and minerals such as vitamin A, iron, and zinc.

A key player in the world of biofortification, HarvestPlus came under A4NH's umbrella in 2012. A leading biofortification program jointly established by IFPRI and the International Center for Tropical Agriculture (CIAT), HarvestPlus continues to make progress toward getting biofortified crops on tables throughout South Asia and Africa.

During its first phase from 2004 to 2008, HarvestPlus set nutritional targets, screened gene banks for plants with elevated micronutrients, began breeding, and established protocols for measuring micronutrient levels. This phase also focused on identifying target populations that would benefit from biofortified crops.

Currently in its second phase, HarvestPlus is developing seven biofortified products including cassava, maize, beans, and sweet potato, all of which contain vitamin A, iron, or zinc. These will be disseminated to at least 500,000 people in nine countries by the end of 2013.

In its third phase, starting in 2014, HarvestPlus will focus on scaling up its biofortified crop portfolio. Joining with A4NH's network of research and implementation partners, HarvestPlus will mainstream biofortification through public and private partnerships and scale up delivery of micronutrient-enhanced staple crops.

Researchers will also continue to develop and test new varieties of biofortified staple crops with even higher levels of nutrients. With each step forward in the world of biofortified crops, and along with other interventions, we get one step closer to banishing hidden hunger from the world's most at-risk populations.

HarvestPlus and its partners have already tasted success. New biofortified crops have been developed, tested, released, and will soon be scaled up. In 2012, HarvestPlus celebrated new crop launches across the globe. In Nigeria, vitamin A cassava and two vitamin A hybrids of maize were launched; in Rwanda, five new varieties of colorful iron beans were released; in Zambia, three vitamin A maize varieties were launched; and in India, a group of farmers were the first to grow an improved high-iron version of pearl millet. Also in 2012, new evidence confirmed that biofortified orange-fleshed sweet potato provides significant amounts of vitamin A, improving micronutrient intakes among women and children in Uganda. HarvestPlus is testing the nutritional efficacy of each of its crops in addition to studying farmer adoption and consumer acceptance, to ensure continued success towards improved nutrition among target communities.

Agriculture-Associated Diseases

More than 60 percent of the newly identified infectious diseases that have affected people over the past few decades have been caused by pathogens originating from animals or animal products.

Theme 3 focuses on managing the health risks associated with food safety, emerging diseases, zoonoses, which are transmitted between animals and humans, and diseases associated with agricultural intensification. Often the riskiest food chains are for some of the most nutritious foods: animal-source foods and fresh vegetables. In agricultural areas that use more water, people face increased risk of infectious diseases, especially through zoonoses from livestock and wildlife as well as diseases that are water-borne and vector-borne (that is, transmitted by an organism).

This research area emphasizes better management of agricultural systems to control food-safety risks and reduce the incidence of human disease. Research in this area focuses on the following:

1. Food safety, including mycotoxins (fungal toxins that contaminate staple foods) and other food-borne or water-transmitted biological hazards
2. Zoonoses and emerging infectious diseases
3. Capacity building to address other health risks in agroecosystems resulting from the intensification of agriculture

“Our collaboration with A4NH makes it possible for us to **engage a global community** of researchers and practitioners who are developing more nutrition- and health-sensitive agriculture in low- and middle-income countries.”

— Professor Jeff Waage

Director, London International Development Centre
Leverhulme Centre for Integrative Research on Agriculture and Health

Zoonoses are infectious diseases which can be transmitted between animals and humans.

Many of the health risks associated with agriculture have health, economic, and social impacts that disproportionately affect the world's poor and are not well regulated. What's more, the most important incentives to safe production—private demand and effective regulation—are missing. This research area generates evidence about the prevalence, dynamics, and burdens of agriculture-associated diseases by developing and testing the methods, tools, and approaches needed to better manage such diseases. The research focus began with mapping where select high-priority diseases are found. As we advance, we will develop and test new diagnostic, detection, and surveillance technologies to identify critical control points. Then, A4NH research can shift to risk management and delivery strategies that work in informal markets and marginal areas.

Unsafe food actually kills more people in developing countries than hunger.

Setting Priorities & Making Progress for Agriculture-Associated Diseases

West Nile Virus. SARS. Ebola. In recent years, zoonoses, or infections that pass from animals to people, have appeared in the news with increasing frequency. Zoonoses cause about 75 percent of new infectious diseases in people. The media spotlight tends to focus on emerging diseases, especially those such as SARS and highly pathogenic avian flu that spread rapidly around the globe. Worse yet, some zoonoses may be highly lethal and for many, like Ebola, no treatment exists. Although endemic zoonoses, including pig tapeworm and Brucellosis, which spread through unpasteurized dairy products, draw less attention than other zoonoses, they have killed millions of poor people. While these diseases have been eliminated in high-income countries, they continue to sicken and kill the poor in developing countries.

To combat zoonoses of the poor, A4NH researchers assume that the high disease burdens call for a new arsenal of weapons. We have three research goals: (1) prioritizing diseases based on burdens and potential control benefits; (2) developing and piloting novel interventions that offer opportunities to achieve benefits at scale; and (3) using evidence to influence policy. Because surprisingly little quantifiable evidence exists on the prevalence, disease dynamics, and health and economic burdens of zoonotic diseases in low-income countries,

measurement is our priority. In fact, all A4NH research is guided by the maxim that what cannot be measured, cannot be managed. After we collect the missing information, we will combine it with new research insights to design and test risk-mitigation strategies that benefit the poor.

One disease control challenge in low-income countries is how to quickly respond to outbreaks. Smart risk targeting, or disease prediction, as well as supporting more rapid and effective responses, can help control outbreaks. A4NH's current research into Rift Valley fever in Africa investigates both disease prediction and outbreak responses. For better prediction, ILRI and its partners established an arbovirus discovery platform, or shared research hub, that uses the latest sequencing and bioinformatics tools to link changes in pathogen populations to livestock intensification and other agroecological changes. The platform published the first-ever report on Nduma virus in pigs. To improve responses to outbreaks, researchers are working with veterinary and public health programs in Kenya to break down the steps in a response and highlight critical information needs at each step of the way to both improve and accelerate decision-making that can ultimately save lives.

Globally, the highest-profile zoonosis over the past decade has been highly pathogenic avian influenza (HPAI with H5N1 influenza virus). As HPAI spread in East and Southeast Asia and then to South Asia and parts of Europe and Africa, large-scale control activities, including vaccination and culling, were immediately applied at scale. The specific role of HPAI control efforts in mitigating health and economic risks for poor people was a critical and overlooked issue, according to A4NH researchers. Hundreds of millions of people in low-income countries rely on poultry for their livelihoods. Poultry meat and eggs provide nutritious food, particularly for young children. Yet an analysis of research findings revealed that in some cases recommended control strategies resulted in undue harm to smallholders compared to the costs and benefits to others. With high-density smallholder poultry locations such as Java,

vaccination of backyard poultry was not practical because the large size and heavy turnover of the chicken population meant that optimal vaccination coverage could never be reached. In West Africa, the first affected country, Nigeria, made very credible efforts in its response to HPAI. However, the vaccination and culling efforts that were advised based on the Asian HPAI experience were not necessary in Africa. In retrospect, researchers can see that, under most conditions, HPAI did not spread quickly in Africa and would have likely burnt out without large investments in active control because of the differences between Africa and Asia in trade and population density. In fact, a number of African countries recognized this and redirected some resources for HPAI-specific control to more general efforts to strengthen animal and public health.

Within A4NH, a team at ILRI leads research into agriculture-associated disease risk. Together with partners in 2012, ILRI took a new approach to prioritizing zoonoses in Asia and Africa, as noted in *Mapping of Poverty and Likely Zoonoses Hotspots* (<http://cgspace.cgiar.org/handle/10568/21161>), a report for DFID. ILRI's report updated and expanded global maps on poverty, livestock, and emerging zoonoses hotspots. Besides identifying key zoonotic hotspots for the poor, the report is helping to inform A4NH's zoonotic research by targeting diseases, locations, major risk challenges, and opportunities for disease control. It is also helping to define research priorities based on real conditions in disease hotspots.

Brucellosis, which is transmitted to humans mainly through the consumption of unpasteurized dairy products, is the most common bacterial zoonotic infection worldwide

Rift Valley fever is a virus spread to livestock mainly through bites from infected mosquitoes. Most humans get infected by having direct or indirect contact with the blood or organs of infected animals, resulting in serious health effects as well as economic losses from deaths of infected livestock.

Integrated Programs and Policies

Theme 4 addresses the need to integrate the agriculture, nutrition, and health sectors at the program and policy levels to achieve positive nutrition and health impacts. Although agriculture programs have been shown to improve household food security and income and, when gender-sensitive, to empower women and enhance their control over resources, evidence of impacts on nutritional outcomes is scarce at best. Research in this area is testing and rigorously evaluating new ways to effectively integrate agriculture and nutrition interventions and reach and empower women and communities. Findings lead to a better understanding of how, how much, in what contexts, and at what cost agricultural development programs can improve nutritional outcomes.

This research area consists of two mutually reinforcing components:

1. Supporting and evaluating integrated program implementation
2. Providing evidence to support policy and investment decisions

“Agricultural-based solutions such as enhanced homestead food production and orange-fleshed sweet potatoes offer long-term solutions that can truly transform the lives of program participants, particularly women. Through our work with A4NH partners, we can now develop a **robust evidence base** of these programs’ impacts and better understand how to improve design and implementation to make them even better.”

—Shawn K. Baker
Vice President and Regional Director for Africa
Helen Keller International

On the program side, researchers work closely with implementers on a range of interventions that improve nutrition outcomes both through more direct, nutrition-specific programs, such as the provision of micronutrients; that address immediate determinants of nutrition and less direct, nutrition-sensitive programs, such as social protection, education, and food security; and that address the underlying determinants of nutrition. Through baseline, mid-point, and end-of-program evaluations, researchers are examining the “what” and “how” of each intervention and investigating the nutrition and health indicators that need to change. On the policy side, this research is promoting a supportive and enabling cross-sectoral policymaking process and investment environment to maximize the nutrition- and health-sensitivity of agricultural policy.

Better Evidence to Guide Program Design and Policy

It may seem like growing more nutritious crops and improving agricultural productivity should lead to improved nutrition and health. However, hard evidence linking agriculture programs to improved nutritional outcomes is scarce, making it difficult to confirm any links.

Many blame this uncertainty on weak program objectives, design, and implementation, compounded by poor quality impact evaluations within the agriculture and health sectors. And while evidence reviews have been important for describing the current landscape of interventions and policies, there

is still a scarcity of hard evidence. A4NH and its partners are focusing on building the evidence base on linkages among agriculture, nutrition, and gender. Building on A4NH's portfolio of research on what works for achieving better nutritional outcomes, the team is carrying out rigorous evaluations of new and enhanced agriculture programs that are designed to be "nutrition-sensitive": that is, they address some of the underlying determinants of nutrition – e.g. income, food security, women's empowerment, optimal care and feeding practices, access to health and sanitation services – and incorporate specific nutrition goals and interventions.

In 2012, IFPRI collaborated with Concern Worldwide and Helen Keller International in Zambia and Burkina Faso, to evaluate integrated agriculture, nutrition, and gender programs, generating evidence on whether these programs improved nutrition, health, and gender equity, and also, how and through which pathways impacts are achieved. This provides critical information for policymakers on what works and how it works in different contexts.

Evaluations of the Alive and Thrive and PM2A programs are providing evidence over the next two to five years of how programs in the health sector contribute to improved nutrition outcomes. New research on policy platforms has begun in three other projects: Transform Nutrition, a consortium that strengthens the evidence base on nutrition, Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition (POSHAN) in India, and Leveraging Agriculture for Nutrition in South Asia (LANSA). In 2012, the Tackling the Agriculture Nutrition Disconnect in India (TANDI) project produced policy briefs on how agriculture can become pro-nutrition, while Bioversity and FAO produced a policy book on sustainable diets and launched a four-country program looking at biodiversity and nutrition.

“An innovative science-based marriage of nutrition and agriculture will significantly contribute to overcoming the extensive malnutrition now prevalent in most developing countries. We are happy that IFPRI and other CGIAR institutions will participate in the LANSa Program. Our aim is to help small farm families overcome major nutrient deficiencies in their diets by teaching them how to apply agricultural remedies to nutritional maladies. The work done under A4NH will be of immense help in converting every family farm into a biofortified farm.”

—Professor M. S. Swaminathan, Founder and Chairman, M S Swaminathan Research Foundation

SPOTLIGHT

About Alive & Thrive

Alive & Thrive, funded by the Bill and Melinda Gates Foundation, is an interdisciplinary project in Bangladesh, Ethiopia, and Vietnam. With an emphasis on learning and innovation, Alive & Thrive works through household, community, health facility, and mass media interventions to identify effective strategies that will improve infant and young child nutrition and inform policies and programs around the world.

About PM2A

Preventing Malnutrition in Children Under Two Years of Age (PM2A) is an approach that targets mothers during pregnancy and children up to two with a package of fortified food rations, preventive health visits, and communications about behavioral change related to maternal and child health and nutrition. These interventions help address the underlying determinants of malnutrition. The PM2A approach is being evaluated by IFPRI, in partnership with the Food and Nutrition Technical Assistance III project (FANTA), managed by FHI360, with funding from the United States Agency for International Development (USAID). The approach is tested in Burundi and Guatemala to help maximize impact, ensure cost-effectiveness, and enable scaling up in different contexts.

About LANSa

Leveraging Agriculture for Nutrition in South Asia (LANSa) is a research consortium funded by the Department for International Development (DFID) and led by the MS Swaminathan Research Foundation. It seeks to understand how South Asian agriculture, food policies, and interventions can increase their impacts on nutrition, particularly of children and adolescent girls. The program is examining current agriculture policies and activities in Afghanistan, Bangladesh, India, and Pakistan with a goal of proposing new initiatives that link agriculture with nutrition and promote cooperation throughout the region.

About Sustainable Diets and Biodiversity

A4NH partner Bioversity, along with FAO, launched a four-country program to explore biodiversity and nutrition with support from the Global Environment Fund. To fill gaps in food composition data for local diets, the program assessed the nutritional quality of indigenous plants and neglected and underused species. Data from this study contributed to FAO's open access food composition database for West Africa, INFOODS, which provides essential data on local and traditional foods in the diets of rural Africans, aimed at mainstreaming food biodiversity into nutrition programs and policies.

Gender Strategy

Many agricultural projects that aim to improve nutrition and health are now zeroing in on what's happening at the intra-household level. This is a way to better understand how individuals' health and nutrition are affected by gender issues at the grassroots.

Examining factors that determine how and why impacts may differ within the household requires an understanding of the differences in the roles, responsibilities, decisionmaking patterns, and bargaining power of men and women.

**Who raises which crops and which animals?
How are labor and agricultural inputs
allocated? How and by whom are agricul-
tural outputs distributed and processed
along a value chain? How are food and
income distributed within the household?**

Gender-specific responsibilities can affect the different hazards men and women are exposed to as a result of associated agroecosystems. Ignoring the role gender plays in agriculture can make nutrition and health outcomes worse, particularly for young children. A4NH recognizes that understanding and addressing gender issues is necessary in order for agricultural technologies, interventions, and policies to contribute to equitable health and nutrition. The goal of our Gender Strategy is to help achieve the program's nutrition and health objectives through greater attention to gender roles and implications within value chains and in programs and policy impact pathways.

The A4NH Gender Strategy was submitted to and approved by the CGIAR Consortium in 2012. It forms a solid base for prioritizing gender research across our portfolio. Adoption studies of

biofortified crops released in 2012 are informing HarvestPlus delivery strategies, which will take into account decisionmaking within households, seed variety dissemination, and labor practices so that nutritional benefits are equitable.

By collecting gender-disaggregated data as part of our food safety research, researchers have been able to describe differential gender risks, knowledge, attitudes, and practices related to cryptosporidiosis and other gastrointestinal illnesses that affect both farmers and consumers in a number of different value chains. This data will be used to design and test risk-mitigating interventions to improve food safety and protect smallholders.

To strengthen capacity for gender research in agriculture, nutrition, and health, A4NH will partner with academic institutions and development implementers to ensure our research and recommendations are gender sensitive. We believe that well-integrated gender research within the A4NH portfolio can improve global understanding of the role of gender in the agriculture, nutrition, and health sectors.

Future Directions

In the year to come, A4NH will continue to build upon our accomplishments of 2012. Here are some highlights you can expect from us in 2013:

- We will develop a results framework that includes program-level intermediate development outcomes (IDOs), indicators and, where possible, specific and time-bound targets.
- We will make progress on a comprehensive collection of impact pathways and theories of change that show how A4NH research, together with actions of our partners, contributes to achieving IDOs. This work will include special attention to gender, partnerships, and capacity building.
- We will continue to invest in new partnerships, especially those that can accelerate results. Partnerships will include the following:
 - National research partners and policymakers
 - Private-sector partners, including business schools and those from relevant industries, such as food processing
 - Development banks, including the World Bank and the International Fund for Agricultural Development (IFAD), that work towards agriculture-nutrition goals
 - Program implementers, including NGOs, to expand our reach
- We will strengthen A4NH communications and outreach in order to more broadly disseminate research findings and evidence to those who can use and improve it most.
- We will initiate research in our priority areas, drawing from existing CGIAR and partner research. Priorities will include the following:
 - Examining value chains for healthy diets, emphasizing the health and nutrition implications of existing value chain research
 - Studying nutrition- and health-sensitive landscapes, linking to other CGIAR Research Programs
 - Expanding food safety research as it connects to nutritional quality, with a focus on mycotoxins, health and market risks mitigation, and production innovations
 - Identifying evidence and options for investors and policymakers that demonstrate linkages among food, health, water and sanitation, social protection, and gender empowerment

2012 Financial Summary

A4NH 2012 Expenditure Summary by Research Theme

Research Themes	W1/W2	Bilateral/W3
Theme 1: Value Chains for Enhanced Nutrition	2,164	2,307
Theme 2: Biofortification	1,212	32,439
Theme 3: Agriculture-Associated Diseases	3,215	5,270
Theme 4: Integrated Programs and Policies	1,601	9,212
Gender Strategies *	73	2,596
Management/Coordination	846	0
TOTAL Expenditure (In thousand US \$)	9,111	51,823

Note:

Window 1 (W1) – Funding without restrictions to the CGIAR, allocated by the Fund and Consortium to different CGIAR Research Programs

Window 2 (W2) – Funding allocated by donors to specific CGIAR Research Programs

Bilateral (including Window 3) –Funding contracts for specified research projects between donors and individual Centers

* Bilateral is estimated

Donors

African Agricultural Technology Foundation (AATF)
Asian Development Bank (ADB)
Australian Centre for International Agricultural Research (ACIAR)
Austrian Development Agency
Bill and Melinda Gates Foundation (BMGF)
Carasso Foundation
CGIAR
Concern Worldwide
Department for International Development (DFID)
Donald Danforth Plant Science Center
European Commission
Family Health International
Foreign Ministry of Finland
Germany GIZ
Global Alliance to Improve Nutrition (GAIN)
Government of Denmark
Government of Ireland
Government of Nigeria
Government of Sweden
Government of Switzerland
Government of The Netherlands
HarvestPlus
International Center for Tropical Agriculture (CIAT)
International Centre of Insect Physiology and Ecology (ICIPE)
International Development Research Center (IDRC)
International Fund for Agricultural Development (IFAD)
Johns Hopkins University
McKnight Foundation
Ministry of Agriculture - Peru
Ministry of Foreign Affairs - Finland
MS Swaminathan Research Foundation
Natural Environment Research Council (NERC)
OPEC Fund for International Development (OFID)
Organization of the Petroleum Exporting Countries (OPEC)
The Rockefeller Foundation
Swiss Tropical and Public Health Institute (Swiss TPH)
United Nations Food and Agriculture Organization (FAO)
United Nations Environment Programme - Global Environment Facility
United States Agency for International Development (USAID)
United States Department of Agriculture (USDA)
University of Edinburgh (UoE)
USAID/Helen Keller International
USAID/John Snow Research and Training Institute
USAID/Save the Children
Wellcome Trust

**Includes 2012 contributions to A4NH and our partner Centers*

Partnerships

A4NH relies on the collaborative efforts of a global network of researchers, program development experts, and implementing partners, including the following network of Partner CGIAR Centers.

In the coming years, the global A4NH team will continue to grow stronger as we strengthen long-term linkages with other critical partners such as national organizations, implementers, and governments. A4NH welcomes new collaborators, implementers, and funders to join in as we work toward improving the nutrition and health of poor people worldwide. The types of partners vary based on the role they play in A4NH, and are classified into the following broad categories.

CGIAR: CGIAR Research Centers that partner with A4NH

Enablers: Policymakers and decisionmakers, as well as investors, who help create enabling environments at the national, regional, and international levels

Development implementers: Government departments and ministries, United Nations and other global initiatives, NGOs, civil society organizations, and farmers' groups that play critical roles in development programming

Value chain Actors: Private-sector companies, public-private initiatives, associations, and other groups that focus on the quality and safety of foods in value chains

Research institutes: Developed and developing-country research institutes and academic institutions at the national and international level that are involved in agriculture, nutrition, and health work

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Governance

With a small Project Management Unit based at its lead center, IFPRI, in Washington, DC, the A4NH team is guided primarily by existing structures such as the CGIAR Consortium and lead center boards for management oversight. A4NH also draws upon external advice and the participation of several other valuable entities.

A six-person **Independent Advisory Committee** meets annually and provides independent advice on program performance, research priorities, and management and engagement strategies. Next, a **Planning and Management Committee**, including both Consortium and non-Consortium members, connects monthly and truly drives the program, overseeing program activities related to planning, management, implementation, and monitoring. Last, **Center Focal Points** from each CGIAR Center meet twice per year and provide a direct link between A4NH and the Centers. For more information about the A4NH team, leadership, and partners, please visit our website at www.a4nh.cgiar.org.

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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) is designed 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 policymakers 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 on human nutrition and health.

The program draws on expertise from 11 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 (IFPRI).

INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

A member of the CGIAR Consortium | A world free of hunger and malnutrition

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