What Is Hidden Hunger?

One in three people in the world, two billion or more, do not get enough vitamins and minerals—such as vitamin A, zinc, and iron—in their diet. This is known as hidden hunger because those suffering from the condition may seem healthy, but they are more likely to fall prey to illness and infections. In severe cases, hidden hunger can leave children blinded, stunted, or with a reduced IQ, and increase a woman’s risk of dying during childbirth.

Changing the Game

A diverse diet that includes enough fruits, vegetables, and/or animal products usually provides enough vitamins and minerals. However, millions of people, mostly in poorer countries, rely upon staple foods such as cassava or rice that fill up their stomachs but do not provide enough vitamins and minerals for good health. More nutritious foods are often expensive or simply unavailable. Through a strategy called biofortification, HarvestPlus and its partners are tackling hidden hunger using familiar foods that people eat every day. Using conventional breeding methods, scientists have developed new varieties of productive staple food crops that contain higher amounts of vitamin A, iron, and zinc to improve diets and nutrition.

These nutrient-rich crops have several advantages:

- **Targeted**: They can reach rural communities often missed by other nutrition interventions such as supplementation and fortification.

- **Cost-effective**: Breeding the nutrient into a crop variety takes just one upfront investment. Once the trait is in the crop, it stays and through further breeding at low cost, the crops can be adapted to thrive in a range of agroecological zones.

- **Sustainable**: This strategy is centered on staple foods that people already eat regularly. Farmers can save the seeds or cuttings to replant, and share them freely with their neighbors.

<table>
<thead>
<tr>
<th>Iron Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Impairs mental development and learning capacity</td>
</tr>
<tr>
<td>• Increases weakness and fatigue</td>
</tr>
<tr>
<td>• May increase risk of women dying in childbirth</td>
</tr>
</tbody>
</table>

**Iron Deficiency Estimates in HarvestPlus Target Countries**

Democratic Republic of Congo: 71% of children under 5 and 53% of women

India: 70% of children under 5 and 55% of women

Rwanda: 38% of children under 5 and 17% of women

Uganda: 49% of children under 5 and 23% of women

*anemia used as an indicator

<table>
<thead>
<tr>
<th>Vitamin A Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Impairs growth</td>
</tr>
<tr>
<td>• Causes eye damage leading to blindness</td>
</tr>
<tr>
<td>• Increases risk of infections such as diarrheal disease</td>
</tr>
</tbody>
</table>

**Vitamin A Deficiency Estimates in HarvestPlus Target Countries**

Democratic Republic of Congo: 61% of children under 5

Nigeria: 30% of children under 5

Uganda: 33% of children under 5

Zambia: 54% of children under 5

*stunting used as an indicator

<table>
<thead>
<tr>
<th>Zinc Deficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Causes stunting</td>
</tr>
<tr>
<td>• Lowers immunity</td>
</tr>
<tr>
<td>• Increases risk of diarrheal disease and respiratory infections</td>
</tr>
</tbody>
</table>

**Zinc Deficiency Estimates in HarvestPlus Target Countries**

Bangladesh: 41% of children under 5

India: 48% of children under 5

Pakistan: 37% of children under 5

*zunting used as an indicator
By the end of 2013, more than a million farmers had planted biofortified nutritious crops in their fields, from vitamin A cassava in Nigeria to the world’s first zinc rice in Bangladesh. All seven crops in our initial portfolio are now in the hands of farmers. We are diving into delivery to pave the way for more nutritious varieties to come. Our strategy is to release the crops in waves, with each wave being more nutritious and productive than the previous ones.

The nutrition evidence on the benefits of these crops, published in peer-reviewed journals, continues to grow. The question now is not whether farmers should grow biofortified crops, but why they aren’t growing them yet. In 2013, we shared this evidence widely, from the International Congress on Hidden Hunger at the University of Hohenheim in Germany to the 20th International Congress of Nutrition in Granada, Spain. We also “translate” the science so consumers can understand the life-or-death difference that a nutrient like vitamin A can make to a child.

Biofortified nutritious crops also captured the attention and commitment of key partners. Vitamin A orange sweet potato (OSP) made it into USAID’s list of the five most innovative approaches to feeding the planet. The Government of the United Kingdom hosted the first international Nutrition for Growth summit in July and committed to supporting the development and delivery of six biofortified nutritious crops to reach millions of farming households in Africa and Asia.

Support for biofortification also continues to grow outside of HarvestPlus’ direct operations. In its 2013 budget, for instance, the Government of India allocated funds to pilot nutri-farms in 200 districts where foods such as iron pearl millet and zinc rice will be grown. Similarly, several African countries, including Nigeria, Rwanda, and Zambia, incorporated biofortified nutritious foods into their national policies and programs, with the support of their ministries of both health and agriculture.

On World Food Day, HarvestPlus launched an interactive tool called the Biofortification Prioritization Index that governments and other decision makers can use to help them determine which biofortified crops they can invest in so as to have the greatest impact in reducing hidden hunger through improved diets.

HarvestPlus is also working within Codex Alimentarius—international food standards commission established by the Food and Agriculture Organization of the United Nations and the World Health Organization—to propose a common, internationally accepted definition of biofortification. To this end, we presented a discussion paper to the Codex Committee on Nutrition and Foods of Special Dietary Use at its November 2013 session.

Our partnerships with national biofortification programs in Brazil, China, and India continue. In Latin America, our teams organized biofortification national committees in Panama, Guatemala, and Nicaragua, and developed work plans and pilot projects to expand biofortification in this region, building upon the work of AgroSalud, which became part of HarvestPlus in 2012.

In 2013, we further expanded our partnerships. From participation in the CAADP Agriculture Nutrition Capacity Development Initiative to developing a Memorandum of Understanding with World Vision International, we, along with numerous public and private partners, are diving headfirst into delivery as we seek to make biofortified nutritious crops more widely available.

Howarth E. Bouis
HarvestPlus Director
Beans are eaten every day in Rwanda. Ten new bean varieties that are richer in iron have been released in the country over two phases since 2011 in order to improve nutrition. By the end of 2013, some 700,000 farmers were growing these iron beans.

We continued to experiment with a payback system in which farmers too poor to buy iron bean seed received the seed free of charge and repaid in kind after harvest. Iron beans are now almost as widely available as commonly grown bean varieties in some districts. More iron bean seed also started to appear in urban markets in Rwanda, and was exported to neighboring countries such as Uganda, Burundi, and the Democratic Republic of Congo (DRC).

With our governmental partner, Rwanda Agriculture Board (RAB), and others, we continue to support the development of new iron bean varieties to ensure that Rwandan farmers benefit from the most nutritious and best-performing varieties. Biofortification enjoys the Government of Rwanda's recognition and support; the Ministry of Agriculture's Nutrition Action Plan includes the promotion of biofortified crops as one important initiative to improve nutrition in the country.

This governmental ownership of biofortification is critical to our mission to make iron beans accessible to as many Rwandans as possible. The support of other major food security and nutrition actors, such as the United Nations World Food Programme (WFP) and the Food and Agriculture Organization (FAO), is also crucial for iron bean's and biofortification's success. Indeed, in 2013 WFP purchased 50 metric tons of biofortified iron beans from farmers to distribute to populations affected by emergencies. WFP has also committed to increasing its purchase of iron beans to 500 metric tons per season.

Across Rwanda's border in the DRC, iron beans have been dubbed “gorilla beans” not only for their nutritional punch but also because the local gorillas have apparently developed a taste for them. In 2013, HarvestPlus and partners delivered these gorilla beans to 175,000 households in eastern DRC. Through our partnership with the Institut National pour l’Etude et la Recherche Agronomiques (INERA), we released five new iron bean varieties in 2013. This second-wave release brought to nine the number of iron bean varieties introduced in the DRC since 2008. To ensure that Congolese farmers widely adopt iron beans, we trained 275 extension workers to support farmers in multiplying iron bean seed and managing their crop to maximize yields.

Farmers in neighboring Uganda are also adopting iron beans. We are disseminating these nutritious beans in 11 target districts alongside orange sweet potato. To better reach children, who are the most vulnerable to nutrient deficiencies, we are targeting more mothers in our dissemination program. Sixty percent of the people who comprised the 50,000 households we provided with iron bean seed in 2013 were women, resulting in over 90,000 children getting more iron in their diets.
With 100 million Nigerians—60 percent of the country’s population—eating cassava daily, the market for yellow cassava, which provides vitamin A, is enormous. More than 100,000 Nigerian farmers in more than 2,000 villages planted these vitamin A cassava stems for the first time in 2013. Some 650 extension agents and rural facilitators were also trained on best agronomic practices to assist farmers. Our partners are multiplying cassava on at least 650 hectares to feed the growing demand by farmers. When you throw in more than 350 broadcasts of vitamin A messages, several documentaries, radio jingles, and extensive coverage in the news, the future of vitamin A cassava in Nigeria looks very bright indeed.

Three new varieties were released in July 2013, when Minister of Agriculture and Rural Development Dr. Akinwumi Adesina formally launched a national dissemination program for vitamin A cassava under the federal government’s Cassava Transformation Agenda.

The next step was developing new food products from vitamin A cassava. The state government of Akwa Ibom, one of our initial target states, funded the construction of a factory to process gari and fufu (traditional foods) made from vitamin A cassava. Private sector partners in Oyo State are also processing and packaging vitamin A gari and fufu for local and international markets. Model demonstration villages, where the full value chain for cassava can be observed, were set up in each of the four original target states (Akwa Ibom, Benue, Imo, and Oyo) and are fast becoming hubs for technology transfer to neighboring villages.

Research published in the British Journal of Nutrition shows that humans can absorb twice as much beta-carotene from vitamin A cassava than was previously assumed. Since malnourished people absorb beta-carotene and transform it into vitamin A faster than those who are not vitamin A deficient, biofortified cassava could be exceedingly effective in reducing vitamin A deficiency. Another study published in PLOS ONE found that 70 percent of respondents in a taste test conducted in Kenya preferred vitamin A–rich cassava to white cassava, citing its “attractive color, soft texture, and sweet taste.”
Since its official release in 2012, vitamin A “orange” maize has reached more than 10,000 Zambian households. We intensified efforts to popularize orange maize, beginning with children, who are especially vulnerable to vitamin A deficiency. More than 3,000 school children in six different schools had a chance to eat nshima (a traditional food) made from orange maize at lunch during a one-month trial. Eighty percent of pupils, teachers, and parents approved of it, convincing the UN World Food Programme (WFP) and the Zambian Ministry of Education to begin integrating orange maize into school feeding programs.

It was not just students who enjoyed the orange maize; 170 members and staff of the Zambian parliament also savored a taste of the orange nshima, mobilizing support for orange maize and biofortification among leaders and policymakers. The Government of Zambia officially recognizes biofortification, which is included in the National Food and Nutrition Strategic Plan for Zambia 2011-2015. The plan, which focuses attention on the critical first 1,000 days of a child’s life, highlights biofortified crops for reducing micronutrient deficiencies among at-risk populations.

By creating consumer demand for the orange maize, we are creating markets for farmers who grow orange maize not only to feed their families but to generate extra income as well. To this end, HarvestPlus trained more than 4,000 Zambian farmers on the nutritional benefits of vitamin A maize and the diverse ways in which it can be processed and cooked. Nearly 10,000 farmers also learned about orange maize during farmer field days organized by non-governmental organizations and the Department of Agriculture.

Maize is eaten in much of Africa, including the northern part of Nigeria where the government released two open-pollinated varieties of vitamin A maize in 2013. The International Institute of Tropical Agriculture (IITA) developed these varieties in partnership with the Institute of Agricultural Research and Training and the Institute for Agricultural Research. IITA is bulking up seed quantities in order to provide farmers in maize-growing areas with seed by 2015. These new maize varieties are also well-suited to the tropical lowlands of many West African countries, and we expect them to spread beyond Nigeria’s borders.
Vitamin A Orange Sweet Potato

All it takes is one ice cream scoop’s worth of orange sweet potato (OSP) to provide a child with his or her full daily dose of vitamin A. Since 2007, HarvestPlus and its partners have been spreading OSP’s goodness in Uganda. In 2013, we delivered OSP to more than 50,000 farming households. In total, 126,000 households—more than three-quarters of a million Ugandans—are now eating OSP.

Across 13 districts, we trained nearly 25,000 farmers in the best ways to grow OSP. Additionally, we trained 650 community members on the agronomic practices and nutritional benefits of OSP. These community members, in turn, share their new knowledge with farmers and caregivers in their own communities through educational events such as field days, dramas, and group meetings.

To ensure that OSP vines reach all interested farmers, including those who cannot afford to buy them, we continued to run a payback mechanism. Farmers who benefit from this mechanism commit to “pay back” after their first harvest by providing vines to other poor farmers for free.

More than 28,000 households received OSP vines through this payback system in 2013.

Eighty percent of Ugandans listen to the radio for information and entertainment. So, in 2013, we launched My Children, a new radio drama series about OSP (see text box). As a result, demand for OSP vines outstripped the supply. We are working hard to close that gap. During 2013, HarvestPlus Uganda established a system where clean, virus-free OSP plantlets produced by a private lab (BioCrops) were micro-propagated and introduced to vine multipliers. This has resulted in tremendous increases in the yield of the different OSP varieties and has greatly increased adoption of varieties once susceptible to viral diseases.

Where We Work
Uganda

Nutritional Benefits
Provide 50-100% of daily vitamin A needs

Farmer Benefits
High yielding, virus resistant, drought tolerant

My Children, a radio drama series, was launched in partnership with Farm Radio International to educate Ugandan farming families on vitamin A deficiency and the benefits of orange sweet potato (OSP). The 30-episode drama aired on 10 stations in six languages. It used an entertaining plot of love, domestic strife, money, and power to draw in listeners and educate them on the many benefits of OSP. After each five-minute episode, listeners in 350,000 households across 13 districts were invited to send text messages to answer questions about OSP and win prizes. The series created more demand for OSP by engaging listeners and raising awareness on how to grow and prepare this nourishing crop.
Iron Pearl Millet

A new version of a traditional pearl millet variety that has both higher levels of iron and higher yield is now being grown widely by farmers in Maharashtra, India. Nirmal Seeds, a key local partner of HarvestPlus, has been producing and widely distributing this more nutritious variety, nicknamed Dhanashakti, which means prosperity and strength, to rural farming communities in arid, drought-prone regions. In 2013, Dhanashakti reached an additional 25,000 households, bringing to 70,000 the total number of households growing and eating this nutritious pearl millet variety since 2012.

To ensure that they reap the most from iron pearl millet, each year more than 3,000 farmers receive training on the best agronomic and nutritional benefits of the crop. Nirmal Seeds conducts these trainings and other promotional activities through field days and mobile campaigns, among others.

We are engaging private seed companies and public sector institutions to develop iron pearl millet hybrids that are more widely grown than Dhanashakti in order to reach more farmers and consumers.

A study in the Journal of Nutrition showed that traditionally prepared porridges (sheera, uppama) and flat bread (roti) made from iron-rich pearl millet provided the full amounts of iron and zinc needed by iron-deficient Indian children under the age of three. Another study also published in the Journal of Nutrition found that marginally iron-deficient Beninese women who ate a traditionally prepared iron-rich pearl millet paste absorbed twice as much iron as those who ate a paste made from ordinary pearl millet. Less than 160 grams of iron-rich pearl millet flour daily is enough to provide Beninese women aged 18–45 with more than 70 percent of their daily iron needs, 50 percent more than flour made from local varieties.
In Bangladesh, where rice rules at meal times, the first rice variety rich in zinc was released to farmers in early 2013. One thousand farmers received the zinc rice seed to grow on demonstration plots and to multiply seed, setting the stage for wider production and dissemination in the following years.

Besides its higher zinc content, this rice also boasts the shortest maturation period of any *Aman* (rainfed) season rice variety available. Once planted, zinc rice takes only 100 days to mature, 10 to 40 days less than other varieties, allowing farmers to increase the cropping intensity and improve productivity. This, combined with our training program on seed production and preservation—which benefited some 250 seed multipliers as well as governmental and non-governmental extension agents—gives farmers and rice traders in Bangladesh every reason to be excited about the prospects of this new nutritious rice.

Zinc rice is the culmination of more than 10 years of research and development by the Bangladesh Rice Research Institute (BRRI), supported by HarvestPlus. Our work with BRRI continues to develop rice varieties with even higher zinc content. We have also established distribution agreements with 15 governmental, non-governmental, and private sector partners to ensure that many more farmers and households will be growing and eating zinc rice in 2014 and beyond.

Across the border in India, the All India Coordinated Rice Improvement Project also set up nurseries to test new zinc rice varieties on a large scale and in different environments.

### Where We Work
- Bangladesh, India

### Nutritional Benefits
- Provide up to 70% of daily zinc needs

### Farmer Benefits
- High yielding, disease and pest resistant
Across Pakistan, wheat is eaten daily as chapati, a type of flatbread. Scientists are breeding new wheat varieties that are rich in zinc, a crucial mineral missing in people’s diets. Through our partnership with the Pakistan Agricultural Research Council (PARC), we continued to evaluate three zinc wheat lead lines in national varietal release trials. One of these candidate varieties, NR-421, should be ready for release in 2015 as Pakistan’s first biofortified zinc wheat. NR-421 is not only zinc-rich and high yielding, but also resistant to leaf, yellow, and stem rusts, as well as to the deadly fungal infection Ug99—known to spread rapidly and cause up to 100 percent crop losses.

In preparation for its release, we are undertaking public awareness and advocacy campaigns on the nutritional and agronomic benefits of biofortified zinc wheat. We are also engaging the public and private seed sectors on multiplication, branding, and marketing of this nutritious variety.

The Government of Pakistan was confident enough about the prospects of biofortification to include it in two key strategic plans: the eleventh Five-Year Development Plan (2013–2018) and the Pakistan Vision 2025.

Can we make grains more zinc-rich by simply applying a zinc fertilizer to the soil or a crop’s foliage? HarvestZinc is evaluating this approach, known as agronomic biofortification, in experiments with wheat and rice across Asia. Scientists conducted experiments in five countries and 19 locations over two years and found that a single spray of zinc sulphate applied to the plant’s foliage raised the concentration of zinc in wheat by about 25 percent. Zinc sulphate is the most commonly applied foliar fertilizer, but other zinc-based foliar fertilizers were found to increase zinc concentration by as much as 42 percent. HarvestZinc’s experiments also confirmed that soil zinc application can improve wheat grain yields by as much as seven percent and rice grain yields by six percent. These experiments were conducted in major wheat- and rice-growing countries, including India, Pakistan, China, Turkey, and Thailand.
Financial Summary

2013 HarvestPlus Disbursements By Category (In thousand US dollars)

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Development</td>
<td>12,471</td>
</tr>
<tr>
<td>Human Nutrition</td>
<td>4,529</td>
</tr>
<tr>
<td>Impact &amp; Policy Analysis</td>
<td>2,501</td>
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<tr>
<td>Delivery</td>
<td>7,432</td>
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<tr>
<td>Communications &amp; Development</td>
<td>1,994</td>
</tr>
<tr>
<td>Administration</td>
<td>2,890</td>
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<tr>
<td>Country/Region Program Support</td>
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<tr>
<td><strong>Total Unrestricted</strong></td>
<td><strong>33,260</strong></td>
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<tr>
<td>GC9 Project</td>
<td>330</td>
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<tr>
<td>HarvestZinc Project</td>
<td>373</td>
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<tr>
<td><strong>Total Restricted</strong></td>
<td><strong>703</strong></td>
</tr>
<tr>
<td><strong>Total Disbursements</strong></td>
<td><strong>33,963</strong></td>
</tr>
</tbody>
</table>

Unrestricted Disbursements by Category

- **Crop Development**: 37%
- **Human Nutrition**: 14%
- **Delivery**: 22%
- **Impact & Policy Analysis**: 8%
- **Communications & Development**: 6%
- **Administration**: 9%
- **Country/Region Program Support**: 4%

2013 Donors

- Bill & Melinda Gates Foundation
- US Agency for International Development (USAID)
- UK Department for International Development (DFID)
- Agriculture for Nutrition and Health (A4NH)
- Zinc Project Group
Governance

2013 Program Advisory Committee Members

Jeroen A. Bordewijk
Senior Vice President (Retired), Unilever Corporation, Supply Chain Excellence Programme, Netherlands

Wanda Collins
Director, USDA Plant Sciences Institute, United States

S. Mahendra Dev
Director & Vice Chancellor, Indira Ghandi Institute of Development Research, India

Ruben Echeverria
Director General, CIAT, Colombia

Shenggen Fan
Director General, IFPRI, United States

Richard (Dick) Flavell
Chief Scientific Officer, Ceres Inc., United Kingdom

Mahabub Hossain
Executive Director, Bangladesh Rural Advancement Committee (BRAC), Bangladesh

Anna Lartey
Associate Professor, Department of Nutrition and Food Science, University of Ghana, Ghana

Peter McPherson (PAC Chair)
President, Association of Public and Land-grant Universities (APLU), United States

Patrick J. Murphy
Vice President (Retired), Bank of America, United States

HarvestPlus Team
Representing more than 20 countries, HarvestPlus team members bring many years of experience across different disciplines and from both the public and private sectors. HarvestPlus team members are based at the International Center for Tropical Agriculture (CIAT) in Cali, Colombia, and the International Food Policy Research Institute (IFPRI) in Washington, DC. Many are posted in countries where nutrient-rich food crops are being released. There are now HarvestPlus offices or team members in Bangladesh, Brazil, the Democratic Republic of Congo, India, Nigeria, Pakistan, Rwanda, Uganda, and Zambia. A complete list of team members and their biographies can be found on the HarvestPlus website at www.HarvestPlus.org.

Publications & Media


Note: All publications are available for download from the HarvestPlus website

Selected Media Coverage
- New process 'could develop biofortified cassava faster', SciDevNet, December 5, 2013
- Climate-smart pearl millet variety may be a game changer for nutrition, Feed the Future, November 22, 2013
- Can the B-word beat malnutrition?, IRIN, September 25, 2013
- ‘Super’ bajra fights malnutrition, The Times of India, August 23, 2013
- Brazil develops ‘superfoods’ to fight hidden hunger, IPS, July 17, 2013
- Biofortification may hold keys to “hidden hunger”, IPS, June 21, 2013
- Supercrops: Britain pledges large-scale funding to boost health of undernourished people in Africa, The Independent, June 17, 2013
- Launching a nutri-farm movement, Financial Chronicle, May 15, 2013
- India fortifies food to fight ‘hidden hunger’, Voice of America, March 5, 2013
- Agricultural policies have a huge impact on nutrition, Live Mint, March 5, 2013
- Biofortification, lasting solutions to micronutrient malnutrition and world hunger, CSA News, January, 2013
2013 Partners

BANGLADESH

CGIAR Partners
International Rice Research Institute (IRRI)

Local Partners
Agricultural Advisory Society (AAS)
Association for Integrated Human Development (AIHD)
Bangladesh Agricultural Development Council
Bangladesh Agricultural University
Bangladesh Rice Research Institute (BRRI)
BRAC
Christian Commission for Development in Bangladesh (CCDB)
Concern on National Problems (CONP)
Integrated Social Welfare Association (ISWA)
International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b)
Mymensingh University
Natu Zibon Rochi (NAZIR)
People's Development Institute (PDI)
Rangpur Dinajpur Rural Service (RDRS)
Shariatpur Development Society (SDS)
Small & Medium Seed Producing Association (SMSPA)
South West Seed Producer Association of Bangladesh (SWSPAB)
University of Dhaka
Unnayan Dhara (UD)

Other Partners
Commonwealth Scientific and Industrial Research Organization (CSIRO)
Flinders University
Harvard School of Public Health
University of Adelaide

DEMOCRATIC REPUBLIC OF CONGO

CGIAR Partners
International Institute of Tropical Agriculture (IITA)

Local Partners
Actions Concertées pour le Développement Rural (ACODED)
ADRA (Adventist Development and Relief Agency)
AGROPRO (Association des Agronomes Professionnels)
Amis des Semences (AS)
Association CADI (Centre Agricole pour la Santé et le Développement Familial (ASDF-ONGD Développement de l'Idjwi)
Association pour le Développement Endogène de Matadi (ADEM)
Association des Cultivateurs et Éleveurs (AJCEDEKI)
Association des Femmes pour la Promotion et le Développement (AFPDE)
Association des Femmes Techniciennes de Développement Rural (AFTDER)
Catholic Relief Service (CRS)
Centre d'Adaptation et de Production des Semences Améliorées (CAPSA)
Centre d'Encadrement pour le Développement Communautaire (CEDECOM)
Centre de Développement Rural (CEDER)/Tshela
Centre de Développement Rural de Rutshuru (CEDERU)
Centre Évangélique Francophone (CEF)-Parole du Salut
Centre pour le Développement Rural de Kwilu-Ngongo (CDRK)
DIOBASS
Ferme “Le Lys”
Ferme de l’Eglise Life Line
GIZ
Groupe Agro Pastoral du Kivu (GAP-Kivu)
Groupe d’Action pour le Développement Durable (GADD)
Groupe d’encadrement des initiatives d’autopromotion sociale (GEIAPSO)
Groupe du Peuple de Dieu (GROUPEDI)
La Main dans la main
Laboratoire d’Appui aux activités Agro-Pastorales au Congo (LAPAC-Asbl)
LAYUKA
Ministry of Agriculture
Ministry of Health
Ministry of Health National Nutrition Program (PRONANUT)

National Institute for Agricultural Study and Research (INERA)
ONGD-Femmes Business
PABU (Projet Agricole de Buhengere)
Paroisse de Mwanda
PAV (Projet Agricole pour les Vulnerables)
Plantation Bakulikira
Plantation Kakondo
Production et Multiplication des Semences (PROMUSEM)
SARCAF
Service National de Semences (SENASEM)
SISI Trading
Syndicat pour la Défense des Intérêts des Paysans (SYDIP)
University of Goma
Université Evangelique en Afrique
University of Bukavu
University of Kinshasa
University of Lubumbashi

INDIA

CGIAR Partners
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
International Food Policy Research Institute (IFPRI)
International Maize and Wheat Improvement Center (CIMMYT)
International Rice Research Institute (IRRI)

Local Partners
Ajeet Seeds Limited
All India Coordinated Pearl Millet Improvement Project (AICPMIP)
Banaras Hindu University
Bayer BioScience Pvt. Ltd.
Bidhan Chandra Agricultural University
Bioseed Research India Pvt Ltd
Birs Agricultural University
CCS Haryana Agricultural University-College of Home Science, Department of Food and Nutrition
Central Rice Research Institute
Delhi School of Economics
Desert Medicine Research Center, Rajasthan
DevGen Seeds and Crop Tech Pvt. Ltd.
Dhule College of Agriculture
Directorate of Rice Research-India
Directorate of Wheat Research-India
Ganga Kaveri Seeds Pvt. Ltd.
Gokhale Institute of Politics and Economics
Haryana Agricultural University
Hytech Seed India Pvt. Ltd.
India Biofortification Program
Indian Agricultural Research Institute
Indian Council on Agricultural Research
Indira Gandhi Krishi Vishwavidyalaya (IGKV) University
Institute of Development Studies, Jaipur
JK Agri Genetics Ltd.
J Nehru Medical College
Junagadh Agricultural University
Kaveri Seeds Co. Ltd.
Kesar Enterprises Ltd.
KISAN Forum Pvt. Ltd.
Mahamana Krishak Cooperative
Maharashtra State Seeds Corporation
Mahatma Phule Krishi Vidyapeeth
Mahyco
MetaHelix Lifesciences Pvt. Ltd.
Ministries of Agriculture, Health, and Education
MS Baroda University, Gujarat
National Agricultural Research Project (NARP)
National Institute of Nutrition
Nirmal Seeds Pvt. Ltd.
Nuziveedu Seeds Pvt. Ltd.
Samridhi
SEED Solutions, SEED Infotech Ltd.
Sai Seeds
Shakti Vardhak Hybrid Seeds Pvt. Ltd.
SNDT Women’s University, Maharashtra
St. Johns Medical Research Center
Swami Keshvanand Rajasthan Agricultural University
Tempest Advertising Pvt. Ltd.
Vibha Seeds Pvt Ltd.

Other Partners
Children’s Hospital Oakland Research Institute-CHORI
Commonwealth Scientific and Industrial Research Organization
Cornell University
Flinders University
Harvard School of Public Health
Johns Hopkins Bloomberg School of Health
North Dakota State University
Ohio State University
Penn State University
Swiss Federal Institute of Technology (ETH-Zurich)
The Kiel Institute for the World Economy
United States Department of Agriculture, Agricultural Research Service (USDA-ARS), North Atlantic University of Adelaide
University of Colorado, Denver
University of Georgia
University of Michigan
University of Oklahoma
Waite Analytical Laboratory
Western Human Nutrition Research Center

NIGERIA
CGIAR Partners
International Food Policy Research Institute (IFPRI)
International Institute of Tropical Agriculture (IITA)
International Maize and Wheat Improvement Center (CIMMYT)

Local Partners
Agricultural Development Programmes (ADP)
Akwa Ibom State University
Cassava Growers Association of Nigeria
Damisa Gurus
Development Dynamics
Dominican Centre for Training and Development
ENVOY Agricultural Services
Federal College of Agriculture - Akure
Forward Africa
Humane Development and Empowerment Project (HEMDEP)
Institute of Agricultural Research & Training (IAR&T)
Justice Development and Peace Commission (JDPC)
Ministries of Agriculture, Education, and Health
National Orientation Agency
National Root Crops Research Institute (NRCRI)
National Television Authority (NTA)
Niji Farms Ltd.
Nollywood – Smile Africa Network
Obafemi Awolowo University
Radio Nigeria
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Other Partners
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SEED Solutions, SEED Infotech Ltd.

Rwanda
CGIAR Partners
International Center for Tropical Agriculture (CIAT)
International Food Policy Research Institute (IFPRI)

Local Partners
Développement Rural Durable (DRD)
Health and Development Initiative (HDI)
IMBARAGA Rwanda Farmer Federation
Kigali Institute of Science and Technology (KIST)
Ministry of Agriculture (MINAGRI)
Ministry of Education (MINEDUC)
Ministry of Health (MOH)
National Laboratory
National University of Rwanda
Rwanda Agriculture Board (RAB)
Win-Win Agritech

Other Partners
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East and Central African Bean Research Network
Flinders University, Australia
Institut des Sciences Agronomiques du Burundi (ISABU), Burundi
Kansas State University
Michigan State University
National Crops Resources Research Institute
National Agricultural Research Organization (NaCRRI), Uganda - Bean Program
North Dakota State University
Nutrisurvey – Jürgen Erhardt
Pan-Africa Bean Research Alliance (PABRA)
Penn State University
SEED Solutions, SEED Infotech Ltd.
Selian Agricultural Research Institute
(SARI), Tanzania
Swiss Federal Institute of Technology (ETH-Zurich)
United States Department of Agriculture, Agricultural Research Service (USDA-ARS), North Atlantic
University of Oklahoma
Waite Analytical Laboratory, Australia
World Food Programme (WFP)

UGANDA

CGIAR Partners
International Food Policy Research Institute (IFPRI)
International Potato Center (CIP)

Local Partners
BioCrops
Caritas - Hoima Diocese
Community Enterprise Development Organization (CEDO)
Kigarama Cooperative and Marketing Society
Makerere University, Department of Food Science and Technology
Mbarara University - Healthy Child Uganda Project
National Crops Resources Research Institute/National Agricultural Research Organization (NaCRRI) - Sweet Potato and Bean Program
TracFM
Volunteer Efforts for Development Concerns (VEDCO)

Other Partners
Africa 2000 Network
Center for Advanced Hindsight, Duke University
Farm Radio International
Millennium Village Project
Pan-African Bean Research Alliance (PABRA)
Rwanda Agriculture Board (RAB)
Samaritan's Purse
University of California, Davis
Virginia Tech University
World Food Programme
World Vision

ZAMBIA

CGIAR Partners
Centre for International Forestry Research (CIFOR)
International Institute of Tropical Agriculture (IITA)
International Maize and Wheat Improvement Center (CIMMYT)
WorldFish Center

Local Partners
Emvest Farms
Government Ministries: Agriculture, Education, Health
Indaba Agricultural Policy Research Institute (IAPRI)
Kamano Seed
Micronutrient Malnutrition Taskforce
National Food and Nutrition Commission

Other Partners
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Johns Hopkins Bloomberg School of Public Health
Land O’ Lakes
Michigan State University
Purdue University
SEED Solutions, SEED Infotech Ltd.
University of California, Davis
University of Wisconsin-Madison
University of Zambia
World Food Programme
World Vision

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*HarvestPlus staff
It all starts with a seed.

One seed. Planting and eating it can mean the difference between blindness and sight. Between a child stunted by poor nutrition, and a child growing to reach her true potential. Between a healthy, productive life, and one compromised at every turn.

Yes, one seed can make a difference.

HarvestPlus is a leader in the global effort to end hidden hunger caused by the lack of essential vitamins and minerals in the diet, such as vitamin A, zinc, and iron.

We develop these nutrient-rich seeds. We make sure they grow as well, if not better, than the ones farmers currently plant. We understand how they will provide better nutrition when eaten in different ways—and we promote them widely, so farmers and consumers know that these seeds mean a healthier future for their families, communities, and country.

All this requires extraordinary cooperation. With diverse partners in more than 40 countries, we bring extraordinary assets to the table. The ‘Plus’ in our name doesn’t merely refer to nutritious crops. It’s a symbol of our tenacity and commitment to bridge the divide between disciplines and sectors in search of robust solutions to hidden hunger. We challenge assumptions, embrace risk, and demonstrate impact—all in the pursuit of a global health revolution.

HarvestPlus and its partners
Seeding a better life. One seed at a time.

HarvestPlus leads a global effort to improve nutrition and public health by developing and deploying staple food crops that are rich in vitamins and minerals. We work with diverse partners in more than 40 countries. HarvestPlus is part of the CGIAR Research Program on Agriculture for Nutrition and Health (A4NH). CGIAR is a global agriculture research partnership for a food secure future. Its science is carried out by its 15 research centers in collaboration with hundreds of partner organizations. The HarvestPlus program is coordinated by two of these centers, the International Center for Tropical Agriculture (CIAT) and the International Food Policy Research Institute (IFPRI).