



# Partnerships for Agricultural Development and Improved Nutrition

Partnerships between the public sector, private sector, civil society, local communities and agricultural producers are a critical strategy in achieving the [Sustainable Development Goals \(SDGs\)](#).

Known as public-private partnerships, or PPPs, these collaborations allow the participants to share the risks, responsibilities and benefits of their joint investments.



Eighty percent of global coffee production comes from farmers who live on less than \$1 per day. The International Center for Tropical Agriculture (CIAT) has been working with Catholic Relief Services to [improve the livelihoods of smallholder coffee farmers in the border area of Colombia and Ecuador](#) through the production and sale of high-value, gourmet coffee. Photo credit: Neil Palmer/CIAT

PPPs do not follow a set model and are formed to achieve a variety of objectives.

- **PPPs for agricultural development** include building road and rail networks that connect farmers to urban markets; developing agricultural technologies and tailoring them for the needs of small-scale farmers; and opening new financing opportunities so farmers and agricultural entrepreneurs can expand their businesses.
- **Partnerships to reduce hunger and increase diet diversity** include educating women and men about the importance of nutrition; improving the cold chain for nutritious foods; and creating fortified and bio-fortified foods to reduce the “hidden hunger” of micronutrient deficiency.



Small-scale women farmers near Livingstone, Zambia, have sold 100 metric tons of fruits and vegetables to high-end hotels and supermarkets through a partnership with the [Horticulture Innovation Lab, a USAID Feed the Future initiative](#). Photo credit: Paul Marcotte, Horticulture Innovation Lab Evaluator

## Producers are Partners Too

In 2016, the [International Fund for Agricultural Development \(IFAD\) published a blueprint for Public-Private-Producer Partnerships \(4Ps\)](#) as an expanded paradigm for PPPs. It advocates for the inclusion of producer groups, specifically small-scale farmers, in the design, management, monitoring and evaluation of partnerships for sustainable agriculture value chains.

Producer groups bring essential resources to the table such as knowledge of local growing conditions, access to land and water, capital investment and labor. These 4P collaborations strengthen local buy-in, build leadership capacity and help achieve scale. They can also provide women and youth with opportunities to shape and benefit from the agricultural value chains and nutrition programs that they rely on for income and food.

## Harvesting Zinc for Healthy Soils, Crops and People

### Case Study: The Mosaic Company



Micronutrient deficiency, or hidden hunger, is a lack of vitamins and minerals in the diet and is a devastating form of malnutrition. Two billion people are afflicted, including half of the world's children under the age of five.<sup>1</sup>

Zinc deficiency is a particularly debilitating condition that causes premature birth, cognitive and physical underdevelopment and immune system suppression. Seventeen percent of the global population does not get enough zinc in their diets and nearly half-a-million people die from zinc deficiency every year.<sup>2</sup>

Zinc deficiency rates are highest in the rural areas of developing countries where millions of small-scale farmers grow and consume cereal grains (maize, wheat or rice) that have inherently very low levels of zinc.<sup>3</sup> Improving the zinc concentrations in these crops can dramatically reduce zinc deficiencies for this vulnerable population.

**The Mosaic Company** is one of the private-sector, foundation and university supporters of the **HarvestZinc** project which has identified methods for biofortifying cereal crops with zinc through fertilization. The project was led by **HarvestPlus**, a **CGIAR** institution that develops biofortified food crop technologies to improve nutrition and agricultural productivity.

**Biofortification** is typically done with a breeding technique that produces plants with a higher micronutrient content. Millions of small-scale farmers use biofortified seeds and benefit from the higher nutrient levels. Zinc fertilization is an **agronomic biofortification** strategy where biofortification of the crop happens within the plant during the growth and development process.

Field trials over nine years in 12 countries demonstrated that spraying a fertilizer containing zinc on plants toward the end of the growing process doubles the zinc concentration in the harvested grain.<sup>4</sup> This technique is called **foliar fertilization**.

Depending on the soil's zinc status, application of zinc-containing fertilizers to the soil may also contribute to improved grain zinc levels.

Field trials revealed that fertilizing the soils with a combination of zinc and nitrogen, in addition to foliar fertilization, further enhanced the zinc levels in the plants and the grain. These results

indicate that soil fertilization strengthens the root growth and root uptake system which improves the plant's ability to retain zinc and supports increases in yields.

Of the crops tested, wheat and rice had the strongest improvements in zinc concentration following zinc fertilization.

**Agronomic biofortification is a promising and cost-effective strategy for combating malnutrition in the era of climate change.**

Increased atmospheric CO<sub>2</sub> may cause a decline in the nutrient concentration of crops, including zinc.<sup>5</sup>



Photo credit: Dr. Ismail Cakmak

Properly applied zinc fertilizer is a rapid, effective solution to reducing zinc deficiency, especially for small-scale farmers who grow most of their food.

Combining plant breeding technologies with agronomic biofortification

techniques would amplify the benefits of both approaches and holds significant promise for reducing zinc deficiency in human nutrition while improving crop yield and resilience.

## Pathways to Productivity and Nutrition

Reducing malnutrition in all its forms (undernutrition, micronutrient deficiencies and overweight/obesity) is essential for economic productivity and growth, particularly in agriculture.

Undernutrition and micronutrient deficiencies lead to stunted physical growth, cognitive impairments and increases the risk for chronic disease, all of which make farmers less productive and make it more difficult for people in rural communities to develop off-farm enterprises.

While both men and women have roles to play in reducing malnutrition in the household, women are more likely to spend money on “reproductive” goods that benefit the family, such as nutritious foods, school fees or health care.



Increasing a woman's income through productivity gains and access to agricultural markets can improve the nutritional status, health and earning potential of herself and her family.



Thanks to the [Joint Programme on Accelerating Progress towards the Economic Empowerment of Rural Women](#), indigenous women of Guatemala's Polochic valley are feeding their families, growing their businesses and saving more money than ever before. Photo credit: UN Women/Ryan Brown

## Moove over Cows; Goats Got my Dairy!

### Moving the Trinidad and Tobago Dairy Goat Industry from Farm to Market

#### Case Study: International Institute for Cooperation on Agriculture (IICA)

Goats are an ideal farming option for smallholder farmers living in challenging climates. They convert plant material into milk and meat with an efficiency that makes them an appropriate and practical livelihood, especially for rural farm families. They offer a nutrient-rich alternative source of animal protein and are relatively safe for consumers who suffer allergies or sensitivities, including lactose intolerance.

#### **The Trinidad and Tobago Goat and Sheep**

**Society (TTGSS)** has strategically developed a dairy goat product industry. The 150 members of TTGSS include women and youth; more than 90 percent are small to medium in operation size. These producers share challenges including difficulty in accessing reliable markets, as well as a need for training in science-based animal husbandry methods.



Since 2014, **International Institute for Cooperation on Agriculture (IICA)** has partnered with TTGSS, providing direct technical assistance and helping the producers adopt a value-chain approach, allowing for complementary interventions to improve productivity and business management.

With IICA's support, TTGSS farmers were educated on improved dairy goat breeds, in model housing for enhanced animal safety and encouraged to use local, high-nutrient legumes and grasses as forage for additive-free animal health and nutrition and in boosting milk production. Milking rooms were also constructed, with farmers trained in automated milking operations.

Milk is a very perishable commodity and spoils very easily due to microbial contamination. IICA encouraged adopting best practices in production and sanitation to consistently produce high-quality, safe goat milk and milk products. This was achieved through technical training in Good Agricultural Practices (GAP), Good Manufacturing Practices (GMP), Sanitation Standard Operation Procedures (SSOP) and Hazard Analysis Critical Control Points (HACCP). Such training interventions were supplemented with strategic industry information and practical tools to support improved herd management, farm innovation, efficiency and productivity.

The partnership has strengthened the ability of all public and private-sector participants in the goat value chain to enhance dialogue, decision-making and coordination. The value-chain approach continues to boost the productivity of the goats and quality of dairy products, including butterfat content, odor, taste and safety while also effectively helping producers position themselves for local markets.



The development and implementation of a marketing strategy to expand opportunities beyond the farm-gate sales was also a necessary contribution from IICA. A recent product launch, which included goat's milk, cheeses and Greek yogurt, was an important milestone and indicator of progress with respect to training in compliance with public health requirements, including packaging and labelling standards for value-added processing. Once implemented, the proposal to establish a pasteurization processing plant will add even more value to current production, product and market development.

The TTGSS continues to achieve success from the strategic value-chain approach, increasing the productivity and quality of their goat products. This approach has been accepted and internalized through a **Dairy Goat Stakeholders Committee**, the main platform for enhanced industry dialogue, decision-making and coordination.

Important public educational goods have been created and now serve as reference points, including: [The Trinidad & Tobago Dairy Goat Manual: Breeds, Milking, Herd Health, Records](#); forage fact sheets and [Dairy Goat Milking Handbook for Farmers: A step-by-step guide](#).

To learn more about the **Trinidad & Tobago Goat & Sheep Society**, see their [video on YouTube](#)

## Women's Time Is the Key

Maximizing women's time is the critical consideration for partnerships seeking to increase the productivity of women farmers, as well as nutrition and diet diversity within the home.

These partnerships need to address the two things that most women farmers lack: financial resources to purchase productive inputs and knowledge of agronomic practices.

**Without resources to buy the productive inputs of her choice, such as hybrid seeds, herbicides or mechanization technologies, a woman will spend more time planting, weeding and harvesting to increase her output.**

This reduces the number of hours she has for tasks such as childcare, eldercare, cooking and housekeeping, which in most contexts she will still be expected to perform.



Photo credit: Ann Steensland/GHI

Agricultural extension systems in low-income countries rarely focus on the specific needs of women farmers, excluding them from critical knowledge that could improve their productivity and reduce their labor burden.



While circumstances vary greatly from one community to another, research in Africa and Asia confirms that identifying women’s time and resource constraints is essential to improving both agricultural productivity and maternal and child nutrition.

## The “Golden Girls and Sunny Boys” of Bangladesh Stand Up for Adolescent Nutrition

### Case Study: Global Alliance for Improved Nutrition (GAIN)

Today’s adolescents aged 10-24 years represent the largest cohort (1.8 billion) in human history, and about 90 percent live in less-developed countries.<sup>6</sup> Adolescents have generally been overlooked in global and social health policy but have recently been given significant attention.<sup>7</sup>

However, there are limited data on adolescent nutrition, preventing a clear understanding of their nutritional issues and how to improve them.<sup>8</sup> [Global Alliance for Improved Nutrition \(GAIN\)](#) is leading an effort by advocates, researchers and policymakers to improve nutrition for this growing segment of the population.



GAIN and the **Shornokishore Network Foundation (SKNF)** brought 5,000 young people to the launch of Bangladesh’s new “National Adolescent Nutrition Campaign and Convention” in December 2017.<sup>9</sup> Photo courtesy of SKNF and GAIN.

**Adolescent women in low- and middle-income countries are particularly vulnerable to malnutrition.** Due to gender norms in Bangladesh, girls receive less food in the household and have limited control over their food choices.<sup>10</sup> Insufficient dietary diversity leads to micronutrient deficiencies, anemia and obesity.

Bangladesh is grappling with a staggering adolescent nutrition problem. Of the 36 million adolescents in Bangladesh<sup>11</sup>, 26 percent experience stunting (low height for age).<sup>12</sup> Early



marriage and pregnancy are alarmingly common; nearly half of the women aged 25-49 years have their first child by the age of 18 years.<sup>13</sup> Without proper nutrition, these young women are at a greater risk of mortality, and their children are more likely to be stunted.<sup>14</sup>

**A dynamic network of young Bangladeshi women and men, known as Golden Girls and Sunny Boys, has stepped forward to advocate for better nutrition.**

They are asking government leaders for more resources for nutrition and most importantly, a voice in the policies and programs to support these goals.

While the campaign is just beginning, the determination of these young women cannot be ignored by policymakers and will inspire their peers to be active participants in reducing malnutrition for their generation and those to come.

## **A Race Against Famine**

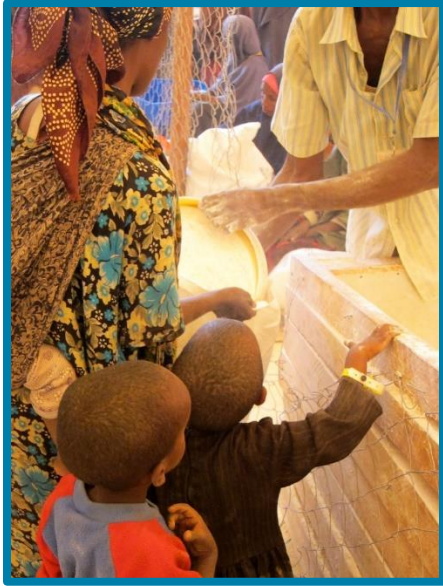
Following the food price crises of 2007-2008 when staple food prices skyrocketed, governments around the world pledged \$22 billion in aid for programs to improve the productivity and sustainability of small-scale farmers.

The private sector, both local and international, is a vital partner in these efforts, offering investments, expertise and access to markets and improved agricultural inputs.

The SDGs enshrined these efforts into a global movement addressing food insecurity and low agricultural productivity, as well as underlying causes, such as extreme poverty, climate change and gender inequality.

**Over the last three years, a new hunger crisis has arisen** driven by prolonged armed conflict and political instability, in conjunction with extreme drought.

International aid donors and agencies are in a race against famine: **124 million people need immediate food assistance to prevent acute malnutrition and starvation.**<sup>15</sup> After several years of decline, the number of hungry people in the world is rising again, to 821 million.



More resources are needed to address this urgent crisis, without compromising the longer-term efforts outlined in the SDGs. Mobilizing these additional investments is a challenge in some donor countries where the political support for foreign assistance is on shakier ground than it has been in the past.

Somali refugees receive food and supplies at the Dadaab refugee camp in Kenya. The UN estimates that [69 million people are refugees or internally displaced](#). They are among the 124 million people in need of immediate food assistance.

Photo credit: Ann Steensland/GHI

## U.S. Commitment to Sustainable Agriculture and Nutrition

In response to the global food price crisis, the U.S. created the [Feed the Future Initiative \(FTF\)](#), under the auspices of USAID.

FTF concentrates U.S. investments in agricultural development, food security and nutrition in select focus countries. [Nineteen countries were initially chosen](#); 12 are in Africa, four in Asia and three in Latin America and the Caribbean.

The [initiative has succeeded](#) in moving 23.4 million people above the poverty line. Farmers in FTF programs have generated \$10.5 million in new agricultural sales. More than 900 agricultural innovations tailored for small farmers have been deployed.

The [Global Food Security Act \(GFSA\)](#) passed by both houses of Congress with strong bi-partisan support and was signed by President Obama in 2016. The legislation authorizes funding for the FTF and ensures that the core tenants of FTF will guide U.S. development partnerships.

The **Global Food Security Reauthorization Act of 2017** passed the House and Senate in 2018 and is expected to be signed into law by President Trump later in the year.

## Endnotes

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- <sup>1</sup> Micronutrient Facts online, Centers for Disease Control and Prevention, accessed August 21, 2018, <https://www.cdc.gov/impact/micronutrients/index.html>.
- <sup>2</sup> Micronutrient Facts online, Centers for Disease Control and Prevention, accessed August 21, 2018, <https://www.cdc.gov/impact/micronutrients/index.html>.
- <sup>3</sup> Cakmak, I., "HarvestPlus Zinc Fertilizer Project: HarvestZinc," *Better Crops*, Vol. 96, No. 2, 2012.
- <sup>4</sup> Cakmak, I., "HarvestPlus Zinc Fertilizer Project: HarvestZinc," *Better Crops*, Vol. 96, No. 2, 2012.
- <sup>5</sup> Myers, S.S. et. al., "Increasing CO2 threatens human nutrition," *Nature*, 510(7503), 139-142, 2014.
- <sup>6</sup> UNFPA. 2014. The power of 1.8 billion: adolescents, youth and the transformation of the future. The state of the world population 2014. New York: United Nations Population Fund.
- <sup>7</sup> Patton, G.C., S.M. Sawyer, J.S. Santelli, et al. 2016. Our future: a Lancet commission on adolescent health and well being, *Lancet* 387: 2423-2478.
- <sup>8</sup> Akseer N, Al-Gashm S, Mehta S, et al. 2017. Global and regional trends in the nutritional status of young people: a critical and neglected age group. *Ann. N. Y. Acad. Sci.* 1393: 3-20.
- <sup>9</sup> "The Golden Adolescent Girls Rally to Improve Nutrition in Bangladesh," GAIN, December 19, 2017.
- <sup>10</sup> Report on Consumer Insight Study on Adolescent Girls' food Consumption Behavior in Bangladesh. 2017. GAIN.
- <sup>11</sup> Population Census 2011. Bangladesh Bureau of Statistics
- <sup>12</sup> HKI and JPGSPH, 2016. State of Food Security and Nutrition in Bangladesh 2014.
- <sup>13</sup> Bangladesh Demographic and Health Survey, 2014.
- <sup>14</sup> Black R.E., Allen L.H., Butta Z.A., et al. 2008. Maternal and child undernutrition: global and regional exposure and health consequences. *Maternal and child undernutrition1. The Lancet Series.*
- <sup>15</sup> *Global Report on Food Crisis 2018*, Food Security Information Network, 2018.