Diversifying into Healthy Diets

Homestead food production in Bangladesh

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The health and lives of billions of people around the world are threatened by micronutrient deficiencies—a lack of essential vitamins and minerals such as iron, zinc, and vitamin A—resulting from poor dietary quality. Vitamin A deficiency, identified as a public health problem in nearly 80 developing countries, is one of the most serious. An estimated 127 million preschool children in developing countries are vitamin A deficient, and nearly 5 million preschoolers suffer from xerophthalmia, which causes irreversible eye damage and blindness in extreme cases. Vitamin A deficiency alone is responsible for 6 percent of all deaths among children under five years of age.

In the early-1980s, Bangladesh had a severe problem with vitamin A deficiency. At the beginning of the decade, more than 1 million children in Bangladesh showed visible signs of the condition. More than 3 percent of the rural population, including half a million children, suffered from night blindness, a condition in which one cannot see in dim lighting. Even worse, 30,000 children were going completely blind each year.[1] However, evidence indicated that children from homes with homestead gardens were less likely to suffer night blindness; it appeared that access to homegrown fruits and vegetables rich in certain forms of vitamin A could help combat vitamin A deficiency and prevent its dire health consequences.

Helen Keller International, a nongovernmental organization that combats malnutrition and blindness around the world, seized on this finding to launch a comprehensive intervention promoting home gardening, small livestock production, and nutrition education. This homestead food production program, implemented by more than 70 local nongovernmental organizations (NGOs) and the government of Bangladesh, succeeded in increasing participants' production and consumption of micronutrient-rich foods, empowering women, and promoting community development. In two decades of operation, homestead food production in Bangladesh has improved food security for nearly 5 million vulnerable people—nearly 4 percent of the population—in diverse agroecological zones across much of the country.[2]

Starting Small and Scaling Up

The homestead food production program in Bangladesh started small. The effort began in 1990 with a pilot program, targeting 1,000 households with a combination of home gardening and nutrition education. The pilot succeeded; results showed that participating women and children were consuming more vegetables and eating a more nutritious and varied diet. The next step was to scale it up, and in 1993, Helen Keller International and partnering organizations launched the NGO Gardening and Nutrition Education Surveillance Project (NGNESP), which broadened the reach of the package of home gardening, nutrition education, and other community-development activities across Bangladesh. By 2003, the project covered more than 4.7 million

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Homestead food production beneficiary with home garden, Bangladesh

individuals in 870,000 households, residing in 210 of the country's 460 subdistricts.[3]

To encourage households to grow fruits and vegetables and eat more nutritiously, Helen Keller International and local NGOs provide households with the materials needed to get started, such as seeds and seedlings. Home gardens alone, however, do not necessarily improve nutrition: nutrition education is needed to translate greater food availability at the household level into healthier diets, particularly for vulnerable household members such as women and children. Homestead food production projects thus also supply nutrition information. For instance, project group leaders may hold meetings to discuss the need for regular consumption of foods rich in iron, zinc, and vitamin A, or they may conduct cooking demonstrations to show the importance of washing vegetables before preparing them, or adding meat or eggs to dishes to increase their nutritional value.

The original model focused primarily on increasing consumption of vitamin A-rich vegetables and fruits, such as sweet gourd, black arum leaves, and bottle gourd leaves, from home gardens. New research in the 1990s, however, showed that pro-vitamin A or carotenoids from vegetables and fruits are less bioavailable (less easily absorbed and used by the body) than previously thought and significantly less bioavavilable than vitamin A from animal sources. Animal-source foods, such as chicken meat, are also a more efficient and bioavailable source of other essential micronutrients, including iron and zinc.

Given this new evidence, a pilot animal-production program was introduced to find out if the home gardening model could accommodate animal husbandry. The successful pilot project resulted in the integration of home gardening and animal husbandry into a broader homestead food production model. Other homestead food production projects and programs have followed, focusing on different populations within Bangladesh and different agroecological regions, such as hilly terrains where tea estates are located, flood-prone areas, peri-urban and urban slums, and areas with high-salinity soil. For instance, homestead food production programs have been implemented in the chars (islands of silt within rivers) and other low-lying floodplain areas in Bangladesh to help the food-insecure population in these areas prevent and mitigate agricultural losses from flooding.

A Chain of Impacts

Homestead food production programming launches a chain of impacts that ultimately leads to improved food security (see Table 21.1). This

Table 21.1—Select impacts of homestead food production programs in Bangladesh

Impact category	Example of impact
Production	
More home gardens	Year-round gardening increased from 3 percent to 33 percent
Increased varieties of foods	Vegetable varieties increased by more than two-fold
Increased quantities of foods	135 kg instead of 46 kg of vegetables in 3 months
Consumption	
Increased consumption of home grown vitamin A-rich foods	Egg consumption increased by 48 percentage points
Increased expenditures on non-cereal foods	Lentils and animal products bought with income earned
Economic status	
Employment opportunities	More than 60,000 rural jobs
Women's status	
Garden management	73 percent of gardens are managed by women, and these women are the main decisionmakers for garden practices and use of the income earned from selling garden produce
Income decisionmakers	At least 90 percent of target households are represented by women

Note: All impact data are for the NGNESP program, except for the data on egg consumption, which comes from another HFP program known as Char II.

Source: Compiled by the authors with information drawn from the following: World Bank. 2007. *Agriculture to nutrition: Pathways, synergies, and outcomes.* Washington, D.C.: World Bank; Sifri, Z. 2007. *Large-scale home gardening programs: The Helen Keller International experience in Bangladesh.* Washington, D.C.: International Food Policy Research Institute; Helen Keller International, Asia-Pacific. 2001. *Homestead food production: a strategy to combat malnutrition and poverty.* Jakarta, Indonesia; Bushamuka, V. N., S. de Pee, A. Talukder, L. Kiess, D. Panagides, A. Taher, and M. Bloem. 2005. Impact of a homestead gardening program on household food security and empowerment of women in Bangladesh. *Food and Nutrition Bulletin* 26 (1): 17–25; Taludker, A., L. Kiess, N. Huq, S. de Pee, I. Darnton-Hill, and M. W. Bloem. 2000. Increasing the production and consumption of vitamin A-rich fruits and vegetables: Lessons learned in taking the Bangladesh Homestead Gardening Programme to a national scale. *Food and Nutrition Bulletin* 21 (2): 165–72; Taher, A., D. Panagides, R. A. Karim, A. Habib, A. Baten, A. Uddin, N. Sultana, G. Stallkamp, and A. Talukder. 2004. Homestead food production in the Chars. Slide presentation. Bangladesh: Helen Keller International.

chain begins with people's adoption of improved or developed homestead gardens. Helen Keller International classifies gardens into three types—traditional, improved, and developed. Traditional gardens are seasonal, found in scattered plots, and involve the production of gourds and traditional vegetables. Improved gardens are typically fixed plots involving the production of a wider variety of vegetables, but are not utilized year round. Developed gardens offer a wider range of vegetables produced in fixed plots all year long. In 2002, a study showed that among active participants in the NGNESP, 78 percent were cultivating developed gardens—that is, growing fruits and vegetables year round—compared with 15 percent of nonparticipants.[4]

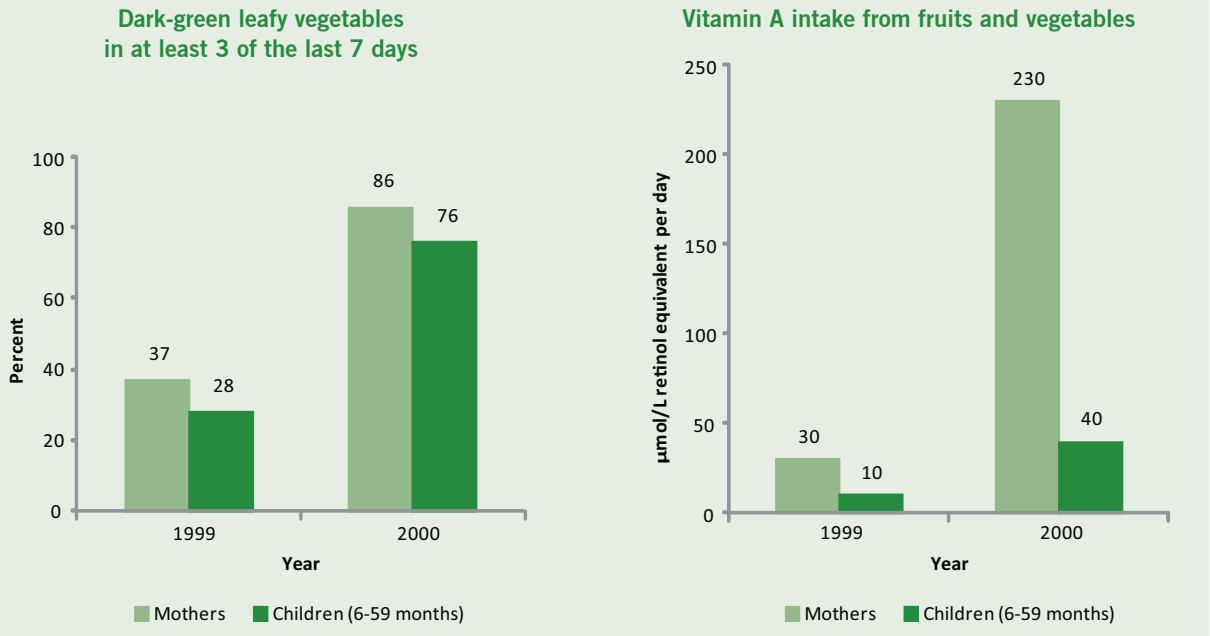
Households participating in homestead food production also grew a greater quantity and variety of foods than nonparticipants. During a three-month period, the participants produced 135 kilograms of fruits and vegetables, whereas the nonparticipants produced just 46 kilograms.[5] Homestead food production interventions have also succeeded in raising the production of ani-

mal-source foods. An evaluation of the animal production pilot in 2003 revealed that program participants produced 200 eggs during a three-month period, compared with 21 eggs produced by nonparticipants.[6]

By combining greater food availability and access with nutrition education, homestead food production has led to increased consumption of higher-quality foods. What is more, homestead gardening programs in Bangladesh increased vitamin A intake, especially among women and children. One study shows that the percentage of children aged 6-59 months and mothers eating dark-green leafy vegetables containing carotenoids, for example, increased from approximately one-third to three-quarters (see Figure 21.1). Research also shows that children living in households with developed gardens consume 1.6 times more vegetables than children without such gardens. Homestead food production has also led to a 48-percent increase in the consumption of eggs, a rich source of bioavailable, pre-formed vitamin A. Although vitamin A consumption was the initial focus of home gardening and animal production programs, it is likely that participants also consumed higher levels of other nutrients, given their increased consumption of vegetables, fruits, and animal-source foods. More research is needed, however, to test whether these improvements in diet quality led to a better nutritional status of individuals, especially among women and children.

Homestead food production also empowers women by giving them greater decisionmaking power within the household and providing new opportunities for them. The program was designed to target households represented by women. Women perceive themselves as making greater contributions to household income because of home gardens, and greater proportions of women participants have reported full decision-making power on a range of issues compared with women who are not participating in the project. Moreover, when programs target women, the vegetables are more likely to be consumed (rather than sold), particularly by children. Also, in intervention areas in the chars, women participating in the program earn a greater income and use these funds to invest in their children's education.

Figure 21.1—Consumption patterns among NGNESP target households



Source: Taher, A., A. Talukder, N. R. Sarkar, V. N. Bushamuka, A. Hall, S. de Pee, R. Moench-Pfanner, L. Kiess, and M. W. Bloem. 2004. Homestead gardening for combating vitamin A deficiency: The Helen Keller International, Bangladesh, experience. In *Alleviating malnutrition through agriculture in Bangladesh: Biofortification and diversification as sustainable solutions*, ed. N. Roos, H. E. Bouis, N. Hassan, and K. A. Kabir. Washington, D.C.: International Food Policy Research Institute.

Overcoming Challenges and Promoting Sustainability

Homestead food production programming in Bangladesh faces several challenges. Changing people's preferences for producing and consuming food can be quite difficult. Bangladeshi farmers, for example, are accustomed to growing rice, and have sometimes hesitated to devote greater time and attention to the production of fruits and vegetables because this new practice appears risky. Another challenge is to ensure that homestead food production not only increases the quantity of foods produced, but also improves the diets of vulnerable household members. Advancing sustainable changes in people's dietary patterns requires an understanding of the potential barriers to change and effective communications to promote food choices, child-feeding practices, and the beneficial ways of allocating food and other resources among household members.

The apparent low bioavailability of micronutrients in fruits and vegetables has raised other challenges. Skepticism about the potential of home gardens alone to reduce micronutrient deficiencies grew. This led to the expansion of homestead food production programs to include animal production. While this shift can greatly increase the potential for homestead food production to improve micronutrient nutrition, it also has added enormous complexity to the programs. For example, model poultry farms must be established in villages and the poultry require immunization and caging. Cows must be dewormed and fed better fodder. In addition, animal production may increase the risk of zoonotic diseases and may reduce the cost effectiveness of programs by requiring more labor and capital.

Despite these challenges, homestead gardening programs combined with nutrition education have proven to be a sustainable approach. In Bangladesh, less than 3 percent of participants drop out of homestead food production projects annually.[7] Homestead gardening is environmentally sustainable as well. Programs embrace environmentally friendly agricultural practices like tree planting, organic fertilizer and pesticide use, safe use of pesticides more generally, and live fencing (using trees and shrubs as fence lines) to enrich the soil with nitrogen.

Homestead food production has also proven to be financially sustainable. Costs of homestead food production programs are shared among participating households, partner organizations, and Helen Keller International; this joint ownership of homestead food production has ensured local buy in, which has played a role in the program's financial sustainability. In addition, locally available materials (like fencing, home-generated manure, and indigenous pest control) can be used, and the multiple uses of garden products present many opportunities for households to earn returns.[8]

Homestead animal production, Bangladesh

Finally, social and political sustainability impact homestead food production. The government continues to invest in the programs, and each year hundreds of local NGOs voice their desire to participate. Planning workshops and information-sharing practices offer regular opportunities for collaboration and capacity strengthening for NGOs. Homestead gardening is flexibly integrated into each local NGO's existing community-based health and development programs.

Lessons for the Future

Homestead food production in Bangladesh began with the initial goal of increasing consumption of vitamin A-rich foods to reduce the health threats associated with vitamin A deficiency. However, by promoting the production of more and healthier foods, educating people on how to improve their diets and nutrition, and raising people's incomes, the large-scale intervention has improved food security for millions of people. And while it has increased the production and consumption of foods rich in vitamin A, further research is needed on the role of homestead food produc-

Learning about nutrition, Bangladesh

tion in addressing the health conditions resulting from micronutrient deficiencies. Nonetheless, the experience of homestead food production in Bangladesh points to various lessons for future projects in the country and elsewhere.

First, translating food production into improved dietary intakes involves making nutrition education and behavior-change communication a high priority—including messages about allocation of resources among household members and optimal feeding and care practices for infants, young children, and women. Education raises participants' awareness and helps ensure that they choose to grow foods rich in micronutrients all year long. Homestead food production in Bangladesh has shown that dialogue and negotiation with caregivers, households, and communities are more effective at changing behavior than lectures and top-down transfers of knowledge.

Second, homestead food production programming has also benefited from adopting a multifaceted, multidisciplinary approach that links agricultural activities to other health and development activities in the community. These linkages between the agricultural sector and the health sector are particularly needed to help ensure that preventative and curative healthcare is available for mothers and children to address the well-known interactions between nutrition and disease.

Third, building on local practices and existing organizations also helps advance the adoption of homestead gardening and avoids paternalistic programming. Rooted in local values, customs, and practices, homestead food production inherently emphasizes community participation at all stages of the program. Local NGOs have been instrumental in funding, designing, and implementing the programs. Helen Keller International collaborates with these local NGOs on strategic planning, developing proposals and work plans, monitoring programs, managing finances, and organizing the involvement of government and other local authorities.

Fourth, a standard but flexible design allows implementing organizations to maintain quality control while also ensuring that programs are responsive to their context. For each program, Helen Keller International is involved for an initial three-year period, and local NGOs continue to support beneficiaries for an additional two years. Another advantage of using a standardized approach is the ease of replication and scaling up, as shown by the broad reach of homestead food production within Bangladesh.

Finally, Helen Keller International and others involved with homestead food production projects have invested in information systems that provide feedback and enable improvements in the interventions. The history of homestead food production in Bangladesh shows an active feedback process between information collected and programming interventions. Information sources include national (or sometimes local) surveys that help determine where to locate the project; monitoring surveys every four months to identify problems; and longer-term evaluations to inform and improve programming and motivate greater investment and commitment of donors, governments, and other partners.

At the end of the day, homestead food production programming has gone well beyond its original objective to take on a range of goals designed to improve lives and livelihoods in rural Bangladesh. In addition to improving diet quality, this holistic package of interventions empowers women, households, and communities through economic and social development. It respects local customs and practices and gains longevity in return. It leaves a legacy of knowledge, awareness, and understanding with its many partners and beneficiaries. If homestead food production continues to be responsive to new information and receptive to changes in the environment and sociopolitical landscape, it will continue to enhance food security for vulnerable populations for years to come. ■

NOTES

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