

# Homestead food production (HFP) in Bangladesh: An Approach to improve diet quality and enhance micronutrients-rich sustainable food security

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OIDA International Journal of Sustainable Development, Ontario International Development Agency, Canada

ISSN 1923-6654 (print) ISSN 1923-6662 (online) www.oidaijsd.com

Also available at <http://www.ssrn.com/link/OIDA-Intl-Journal-Sustainable-Dev.html>

**Abstract:** This paper deals with diet quality and micronutrient nutrition as an essential yet overlooked component of food security- i.e. safe and nutritious food. Vitamin and mineral deficiency (VMD) is at the core of massive malnutrition in the world today. 'Hidden hunger' is a chronic lack of micronutrients which is basically a problem of balanced and healthy diet, affecting two billion people worldwide from reaching their physical and mental potential. Several strategies to combat VMD have been undertaken in Bangladesh on both a short and interim measures. However, agricultural intervention through dietary diversification has been found to be the most viable strategy in the long-term and on a sustainable basis. There is sufficient evidence to believe that higher intake of locally available fruits and vegetables on a regular basis might reverse the VMD. The Homestead Food Production (HFP) program in Bangladesh promotes an integrated package of home gardening, with the aim of increasing the health and nutritional status of women and children. This paper presents major finding derived from an empirical study of HFP in the northern Chittagong Hill Tracts (CHTs), Bangladesh, involving 120 households represented by ethnic women of child-bearing age. The underlying objective is being to provide an effective approach to sustainable nutrition solution in the country. The Chittagong Hill-Tracts is a classic example of an underdeveloped region with an overwhelmingly rural, low income agro-based economy, seeking to achieve basic goals of development in both social and economic terms. There is ample evidence to show that HFP program in Bangladesh has improved food security for more than 5 million vulnerable people in diverse agro-ecological zone. In the study area, the HFP program has significantly improved the food security status of the sample population in terms of production, diversification, consumption and sale of nutritious foods..

**Keywords:** Food Security, Homestead Food Production, Micronutrients and Nutrition

## Introduction

The availability of, and access to, safe and nutritious food is a key policy issue affecting basic survival, nutrition, national security and stability, making sustainable agricultural growth vital to addressing these challenges (Ayers and McCalla 1996; World Bank 2008). Interventions that address poor diet quality and related vitamin and mineral deficiencies (VMD) are, therefore, important considerations for achieving total food security which exists "when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO 1998).

VMD (typically of iron, iodine and vitamin A) is at the core of global 'hidden hunger' problem. It is basically a problem of balanced and healthy diet (Bisealski 2013). Even when dietary energy intake may be sufficient, a lack of dietary diversity and poor quality food intake often leads to this syndrome. VMD affects two billion people worldwide from reaching their physical and mental potential. More than 1 billion people worldwide are actually disabled by them- harmed by mental retardation, learning problems, and blindness. Millions more live in conditions of vulnerability and risks. Women and children in developing countries, particularly from the lower income groups are the most affected or vulnerable (Ayres and Mc Calla 1996; Allen 2003; UNICEF and MI 2004; FAO 2010; Bhutta 2013).

The Millennium Development Goals (MDGs) adopted by the United Nations (UN) recognize the role of nutritional security in human resource development. In May 2002, the General Assembly of the United Nations agreed that the elimination and reduction of VMDs should be one of the principal development goals to be achieved in the early years of the new millennium UNICEF and MI 2004). One of the main outcomes of the Rio+20 ( 2012) Conference was the agreement by member States to launch a process to develop a set of Sustainable Development Goals (SDGs), which will build upon the Millennium Development Goals (MDGs) and converge with the post 2015 development agenda. The theme of this paper is also consistent with the first two Sustainable Development Goals (SDGs) adopted by the UN: Goal-1 End poverty in all its forms everywhere; Goal 2- End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

Several strategies to combat VMDs have been undertaken in Bangladesh as short-term and interim measures. Agricultural intervention in nutrition, however, is found to be the most viable strategies for the long term. Experience provides convincing evidence that agriculture interventions can improve nutrition status of vulnerable groups (Bloem et al., 1996). The HFP program introduced in Bangladesh by NGOs (mostly by the Helen Keller International/ HKI) about three decades ago, promotes an integrated package of home gardening including support for year-round production of vitamin A- rich fruits and vegetables (e.g. sweet gourd, black arum leaves, bottle guard and shazna shak etc.) small livestock production and nutrition education with the aim of increasing household production and consumption of micronutrients-rich foods and, thereby, improving the health and nutritional status of vulnerable groups-mostly women and children (Lannotti et al., 2009).

The HFP programming has now evolved to and expanded to embody a unique, holistic intervention that has increased the availability of micronutrients-rich foods for millions of households while addressing several other aspects of food security including improved incomes and sustainable rural livelihoods, community development, and the empowerment of women. Evidence shows that the program has improved food security for more than 5 million vulnerable people in diverse agro-ecological zones (Lennotti et al., 2009). Scaling up HFP in Bangladesh has been effective and sustainable because of large number of partner NGOs, with their extensive infrastructure and network throughout the country including their dedicated focus on working with poorer households (Talukder et al, 2000).

This paper identifies evidence-based approaches i.e. HFP to improve diet quality that can be achieved through production, consumption and sale of micronutrients-rich food. The main objective of the paper is to present major findings derived from an empirical study of Homestead Food Production (HFP) in the northern Chittagong Hill Tracts (CHTs), Bangladesh, involving 120 households represented by ethnic women of child-bearing age. The underlying objective is being to provide an effective method to sustainable nutrition solution in the country.

### Materials and Methods

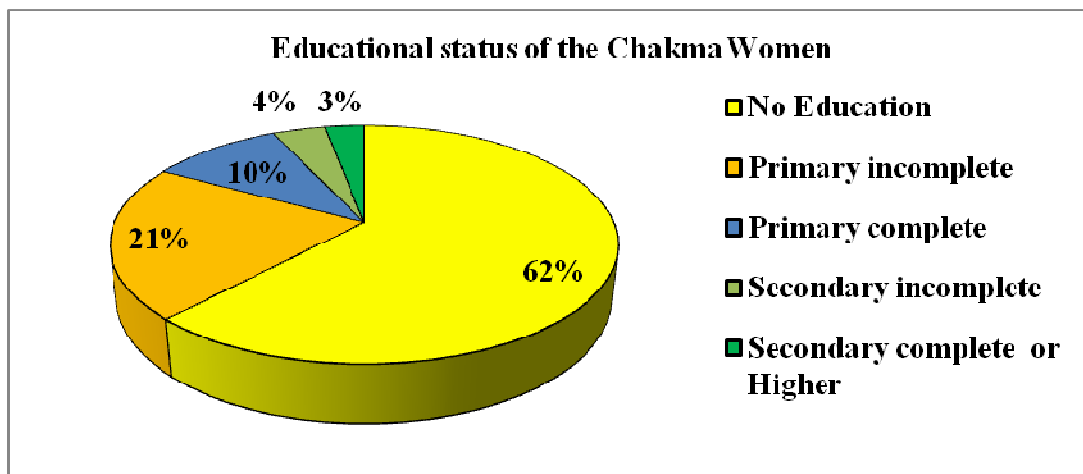
This is an empirical study of HFP, based on the analysis and depiction of data related to household production and consumption of micronutrients-rich foods, mostly vegetables. Other indicators include knowledge level about selected micronutrients, status of household food security, water uses, sanitation and hygiene. The field survey was conducted in the Kobakhali Union, Dighinala Upazila, Khagrachori District. The Six smallest rural settlement units (*village paras*) that were selected for the field survey include *Paras*, namely Rosyamoni Parbari, Narikel Bagan, Purba Shantipur, Gubajoy Karbari, Milonpur, and Dakshin. These *Paras* represent the cases for each of which data have been collected and employed in the analysis. These *Paras* were chosen on the ground that most of the indigenous (*Chakma*) community of Khagrachari District lives in these areas, and they are actively involved with Homestead Food Production (HFP) activities, organized by Integrated Development Foundation (IDF- a leading NGO in the region, financially supported by the Helen Keller International (HKI- a major international NGO) for implementing the program. The field data were collected during the winter season (2015) using qualitative and quantitative approaches, consisting of structured questionnaire, case studies and Focused Group Discussion (FGD), involving 120 randomly selected households who are landless but associated with HFP activities. The target group includes Indigenous (*Chakma*) women of reproductive age. The respondents belong to the Buddhist faith and have maintained their traditional cultural norms.

**Study area:** The Chittagong Hill-Tracts (CHTs) is a classic example of an underdeveloped region with an overwhelmingly rural, low income agro-based economy, seeking to achieve basic goals of development in both social and economic terms. The region comprises one tenth of the total area of Bangladesh, covering an area of 13,295 sq. km, consisting of 77 percent upland (hill), 20 percent undulating bumpy land, and only 3 percent plain land with high potential for agriculture development. Much of its territory is composed of reserve forests. Located in the south-eastern part of Bangladesh, the region enjoys a tropical monsoon climate. There are at least twelve different tribal groups who live in remote rural areas, making access to basic social services difficult. In general, the

people of CHTs are very poor and illiterate. Most of them are agricultural labourers and depends on primary economic activities (selling/collecting forest resources, hunting, indigenous traditional occupation and others traditional occupation) and shifting (jhum) cultivation, producing low crop yield. Although the economy is agro-based, access to cultivable land is extremely limited- a key issue in the region for generating political unrest. A Peace Agreement was signed in 1997, following more than two decades of politically motivated armed conflict, and the region continues to be characterized by highly vulnerable to food and nutrition security, due mainly to their limited availability and access to food as well as employment, income, education, health, water and sanitation, access to infrastructure and services. Geographically, the region is earthquake prone. Illegal excessive logging has lead to deforestation and soil erosion, increasing the region's vulnerability to flush floods and landslides, reducing the availability of arable land. These are the factors responsible for food and nutrition security in the region.

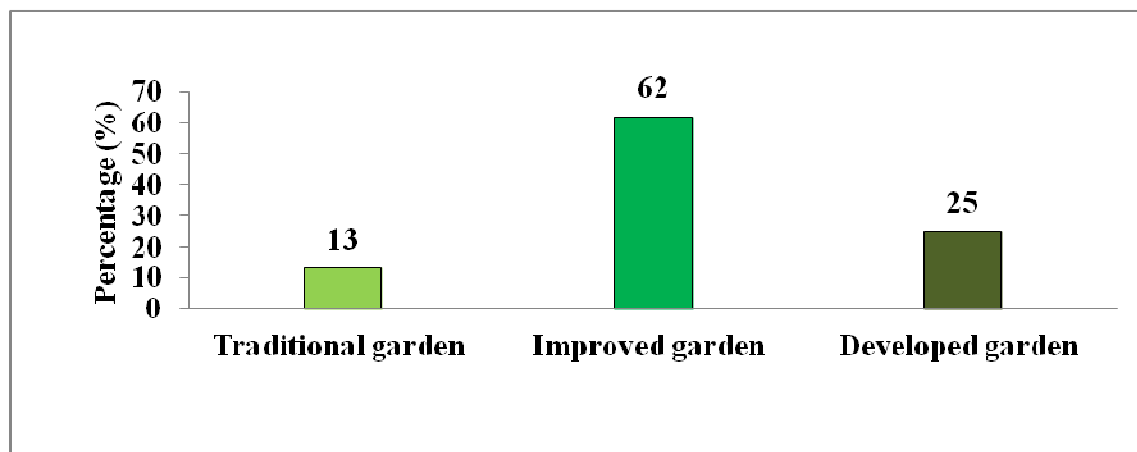
## Results and Discussion

**Socio-economic and demographic characteristics:** The sample respondents represent the *Chakma* women of childbearing age (15-35+ years). Analysis of age structure shows that majority of the Chakma women in the study area are comparatively young. More than 80 percent respondents fall within the age group of 20-35 years. The distribution of educational level of the *Chakma* community exhibits that 62 percent respondents has no formal education at all or functionally illiterate (Figure 1). Only 10 percent women have completed primary level of education. With respect to their occupation, 76 percent of the sample respondents are engaged in HFP activities, 19 percent in farming, and only 5 percent are engaged in the informal sector as day laborers. As much as 50 percent of their house walls are made of bamboo/cane/palm or trunks. The use of mobile phone is widespread in the area (66 percent) compared to radio which is quite low (2 percent).



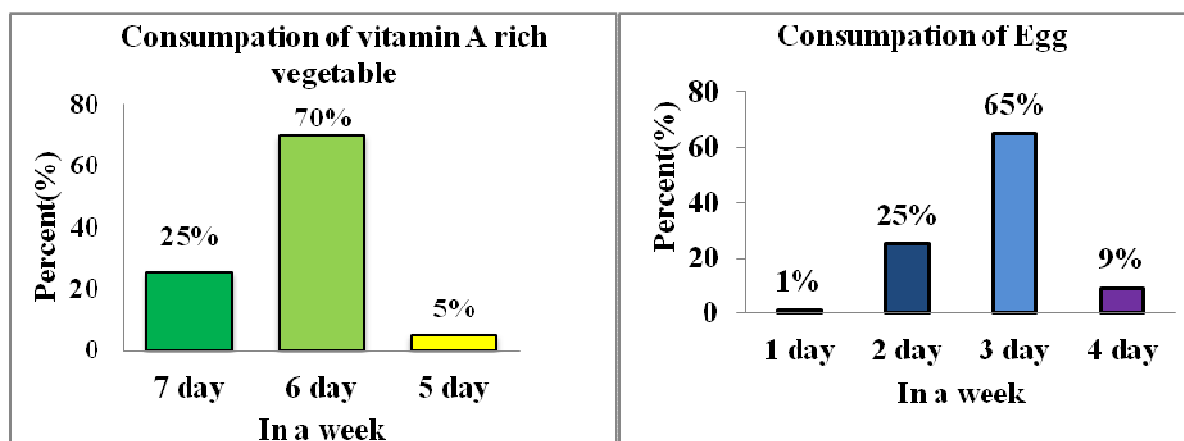
**Figure 1: Educational status of the sample respondents**

**Type of Gardening:** The nature of gardening practices play a vital role in improving diet quality and enhance micronutrients-rich sustainable food security at the household level. Various kinds of home gardens are found in the study area that may be classified as 'traditional', 'improved' and 'developed', based on a number of local criteria. Figure 2 reveals that 62 percent homestead gardens are found improved and 25 percent are developed, producing different kinds of vegetables that did not previously exist in the area. In contrast, only 13 percent gardens were reported as traditional. The traditional gardens are scattered and seasonal plots and only produce gourd and traditional vegetables. Improved gardens produce a number of vegetables in fixed plots, but not throughout the year. Developed gardens produce more varieties of vegetables in fixed plots throughout the year.



**Figure 2: Proportion of sample households with various types of home gardens**

**Consumption of micronutrients-rich foods:** Dietary diversity focuses on the consumption of vitamin A and iron-rich foods (of non-cereal origin) on a weekly basis- a 7 day period. Foods rich in vitamin A are a good source of measure for overcoming Vitamin A deficiency (VAD) in vulnerable population. A number of evidence show that frequent consumption of plant based vitamin A rich foods such as dark green leafy vegetables, or yellow fruits contributes to national health standards. Figure 3 shows the proportion of households who regularly consumes plant based vitamin A rich and animals based vitamin A rich foods in the study area. It is evident that nearly three-quarter of the sample households (70 percent) consumed vitamin A rich vegetables 6 days a week. With respect to consumption of iron from animal sources, 65 percent respondents reported to consume egg 3 days a week. An increased consumption habit of diversified food items was made possible due to the provision of HFP intervention, before which iron rich food did not exist in the study area.



**Figure 3: Household consumption of vitamin A and iron-rich foods**

**Awareness level of vitamin A rich foods:** This section explains women's knowledge level of micronutrients- rich food intake. The knowledge level focuses on various sources of food rich in vitamin A and iron. Figure 4 illustrates the level of *Chakma* women's awareness about food rich in vitamin A and iron. As shown in Figure 4, large proportions of the women are aware about micronutrients rich food in the study area. It is evident from the graph that 52 percent sample respondents are aware of the presence of vitamin A in the green leafy vegetables. Some 41 percent respondents reported to have knowledge about yellow/ orange vegetables and fruits. Regarding awareness level of iron rich food, over half of the child bearing *Chakma* women (54 percent) have knowledge that egg contains iron, followed by meat (17 percent), milk (15 percent) and fish (14 percent). This awareness level is a remarkable

change of mind set among the indigenous Chakma women, because it is the first time they are learning about micronutrients-rich foods. The HFP program in the study area teaches the *Chakma* women not only about nutritional knowledge but also how to prepare balanced and healthy diet in their daily meal. The HFP program works with women at household level and is creating a wonderful opportunity in combating VMDs.

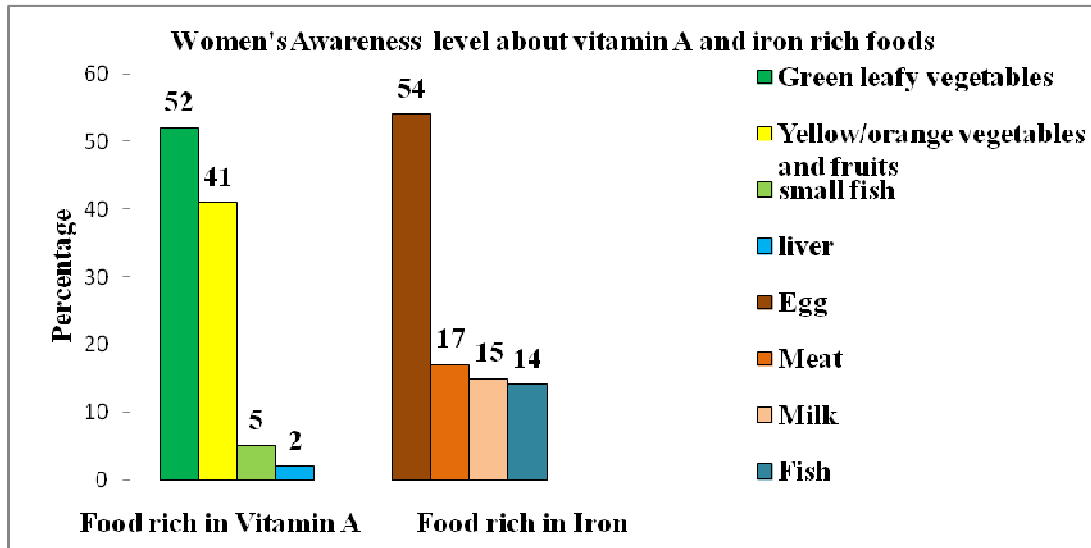


Figure 4: Nutritional awareness of the sample respondents

**Monthly income from HFP:** In the study area, monthly income among the sample households (women head) varies widely from BDT 501-3000 (based on monthly income from HFP). Thus, sample households were categorized into six income groups. Figure 5 depicts the monthly income from home garden by sample households, contributing to income generation activities, improved livelihoods, and household welfare as well as promising small entrepreneurship which, in turn, contributes to rural development. As reported in the field survey, some 36 percent sample households made income BDT 3000 and above, and only 7 percent made BDT 501-1000 in the last month (Figure 5).

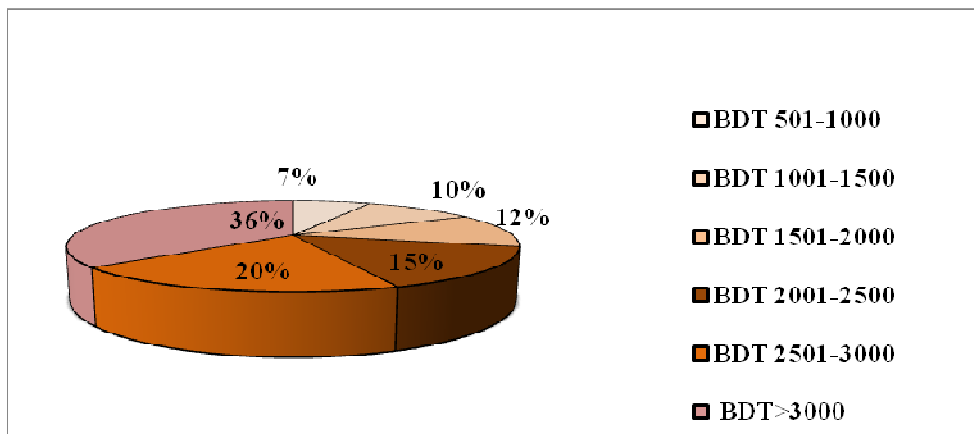


Figure 5: Monthly income from home garden products by the sample households

There is sufficient evidence to convince that HFP program in the study area has improved food security, and in some cases nutrition and other intermediary outcomes for sample population. The main outcomes of HFP program can be classified into two broad categories: (1) increases in food availability- measured by types of garden (improved or

developed) and changes in the amounts and varieties of fruits and vegetables produced, and (2) increases in food accessibility- measured by increased income and expenditures on household level consumption of micronutrient-rich foods. Developed gardens offer a wide range of vegetables and fruits, produced in fixed plots throughout the year. Changes in quantity and diversity of food commodities produced may viewed as an indicator of impacts on household food security- at least from availability perspective.

The key impacts of HFP program include increased production and consumption of micronutrient-rich foods; diversified diet; increased income from home gardens and improved status of women because of empowerment. The indirect impacts are enhanced partner capacity and community development. In quantitative terms, 62 percent homestead gardens were found improved and 25 percent were reported developed in the study area, as oppose to only 13 percent of traditional category. Some 36 percent sample households made relatively high income (upper end of the income range) in the last six months. Around 70 percent sample household represented by the *Chakma* women (of child bearing age) reported to have consumed vitamin A rich foods 6 days a week; 65 percent reported consumption of eggs 3 day a week. Some 52 percent sample respondents reported to have knowledge of vitamin A rich food, mostly green leafy vegetables.

Several prominent features of HFP program in Bangladesh have been responsible for its success in the study area. Home gardens alone will not ensure human nutrition; nutrition education is necessary to translate food production into improved dietary intakes, particularly for vulnerable household members (Ruel, 2001). In this regard, IDF has played a important role in educating *Chakma* women in the study area. The second prominent feature of HFP program is that it builds on local practices (such as local cultivation techniques and varieties understanding and working with traditional customs etc.) using existing structures and organizations. In doing so, HFP focuses on creating community resources (market access for participants) and inherently emphasizes community participation at all stages- design, implementation, monitoring and evaluation (HKI, 2003). Third, HFP works to empower women, particularly, poor rural women in a culturally acceptable role to upgrade skills and knowledge to improve food production, income, and practices (HKI, 2006).

### Conclusion

The integrated package of homestead gardening not only improves household food security through production, diversification, sale and consumption of micronutrients-rich foods, but also it empowers women and communities through economic and social development. Organized, financed and implemented by NGO partners and the Government of Bangladesh, HFP has expanded its reach (in its 20 years of operation, 1981/82 – 2004/05) into over one half of the country's *Upazilas* (240 of the 466 Sub-Districts), and now the programming is replicated in several countries of South Asia, South East Asia and the Pacific, and has begun to take its hold in Sub-Saharan Africa.

### Acknowledgement

We gratefully acknowledge the help and kind cooperation received from a number of organizations in conducting the field survey including the Integrated Development Foundation (IDF); Helen Keller International (HKI); International Centre for Diarrheal Disease Research, Bangladesh (ICDDR'B); Bangladesh Rural Advancement Committee (BRAC); and the Institute of Public Health and Nutrition (IPHN), University of Dhaka.

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