

Impact of Home Gardening on Food Security among Households: A Case Study in Kandy District, Sri Lanka

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Abstract

Home gardening is a farming practice on the area of land surrounding the family home. Kandy district has a unique home gardening system consisting of spice crops, certain food crops, timber and medicinal plants. The main objective of this study is to measure the economic impact of home gardening on households. Further it assesses the association between home gardening and food security level. A standardized questionnaire was used to collect data from a randomly selected sample of 80 households. Chi-square and discriminant analysis were used to check the association between home gardening and food security level and to discriminate the food security levels. Basic statistic indicators of the sample were calculated using descriptive statistics. The study revealed that there is a significant positive association between home gardening and food security level of the respondents. According to the results 77.5% of households with home gardens were food secure and only 55% of households without home gardens were food secure. The proportion of earnings from home gardening to average income, ranged between 7% and 38.29%. Discriminant functions were developed to discriminate respondents according to the food security levels. The home gardens increased food availability of household resulting in increased food security level and reduced the food expenditure. The general idea of the respondents towards home gardening was positive and there is was a potential to popularize home gardening in Kandy district by "Divi Neguma" program

Keywords: Food security, Home gardening, Income generation, Kandyan home gardens

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Introduction

Since ancient times Sri Lankans used to cultivate fruits, medicinal plants, flowers, vegetables in their home gardens, raise animals and kept the environment beautiful and clean. The home garden can be defined as a farming system which combines different physical, social and economic functions on the area of land around the family home (Anon, 1995).

Kandyan Home Gardens (KHG) of Sri Lanka represents a traditional system of perennial cropping which has been in practice for several centuries. These systems are usually in small homestead holdings and are practiced in a few districts, especially Kandy, Matale and Kurunegala in the mid-country region of Sri Lanka. KHG is also called as Kandyan Forest Garden system and is different from other home garden systems mostly in terms of the variety of plants grown (Jacob and Alles, 1987).

A well developed home garden makes a vital contribution to household food security by supplying a variety of nutritious food for daily consumption and providing income from the sales of its products.

Food security can be defined as "when all people

at all times has access to sufficient, safe, nutritious food to maintain a healthy and active life" (Anon, 1996). Food security is based on three main pillars including food availability, food access and food utilization. The Global Food Security Index for 2013 has placed Sri Lanka in the 60th position among 109 countries (Anon, 2014).

Home gardening has many benefits; helps to consume more fresh fruits and vegetables and can control the use of fertilizer and pesticides use. Usually rural residents do home gardening as a farming system in the villages. Therefore, objectives of the study were to find out the economic impact of home gardening on households, assess the association between home gardening and food security, economic and to understand the perception towards home gardening.

Materials and Methods

Data Collection

The study was conducted in Kandy district, during May to June 2014. Forty households were randomly selected from lists of households with home gardens obtained from Agrarian Service Centers and Regional Development Bank of Kandy district. Households with home gardens

were confirmed by observing their home gardens. Forty other households without home gardens were randomly selected from the neighboring areas adjacent to the households of home gardeners for comparison purposes. The households with and without home gardens were distinguished under three characteristics. Household with more than 0.5 Perch land area cultivated, a well organized home garden and more than five food crops cultivated were selected as a household with a home garden.

A face-to-face interview was conducted using two pretested standard questionnaires for households with and without home gardens separately. General household information, socio economic data such as income, expenses and savings, perception to home gardening and details of food crops, spices, other plants and livestock were collected from the questionnaire.

A list of food items was provided with each questionnaire to collect the amount consumed per week by purchasing, home gardening and other sources. Information about food security level of each household was collected using food insecurity core module including 18 questions prepared by Bickel *et al.* (2000), with suitable modifying.

Data Analysis

Basic statistic indicators of the sample were calculated using descriptive statistics. The association between food security level and home gardening characteristics were obtained using chi-square analysis.

Based on 18 question module Bickel *et al.* (2000), food security level was obtained. As an example; those who have responded as 'No' to one, two or zero, for any of the questions, were categorized as food secure and other food security levels were categorized accordingly. If the number of responses as No are 0, 1, 2 for households with and without children are categorized as Food secure, if the number of responses as No are 3, 4, 5 for households with and 3 to 7 for households without children are categorized as Food insecure without hunger, if the number of responses as No are 6, 7, 8 for households with and 8 to 12 for households without children are categorized as Food insecure with moderate hunger and if the number of responses as No are 9, 10 for households with and 13 to 18 for households without children are categorized as Food insecure with severe hunger.

Results and Discussion

Basic indicators of the sample

The study showed that both genders equally involved in home gardening. Majority of the respondents' education level was above secondary education. Among the households with home gardens studied, 50% have integrated livestock to their home gardens. All respondents pointed out that home gardening was done for self-consumption. Self-satisfaction (70%) and reduction of expenses (52.5%) are the other major reasons for home gardening. According to the respondents the excess production of home gardens was exchanged among neighbors (97%), stored (35%) and sold to nearby shops.

Perception towards home gardening and contribution to household economy

The proportion of earnings from home gardening to average income, ranged between a minimum of 7% and a maximum of 38.29%, with a mean of 17.62%. This clearly showed that home gardening contributes to the monthly household income considerably. The revenue gained from selling the harvest from other crops grown, such as clove, nutmeg, cardamom and pepper contributed 14.36% to the monthly income. Thus, the total income generated from home gardening had a significant increment to 32% of the monthly average income. The respondents without a home garden stated that the reasons for not practicing home gardening were time constraints (90%), unavailability of space (25%) and less preference for home gardening (25%).

All respondents revealed that there are benefits from home gardening. Further they stated that home gardening utilizes leisure time effectively (81%), good for health (68.75%), reduces stress (53.75%), is a good exercise (46.25%) and gives psychological satisfaction (41.25%).

Food security levels of the households

According to the food insecurity core module of USDA, 77.5% of households with a home garden were food secure. The remaining 22.5% of households with home gardens were food insecure without hunger.

Among the households without home gardens 55% were food secure while 45% were food insecure without hunger. Food insecure with moderate hunger and food insecure with severe hunger categories were not recorded among the households.

Association between food security level and home gardening characteristics

There is a significant association between home gardening and food security level of the households (Chi square value =4.528, p value = 0.033, significant at 95%). This is the reason for higher food secure percentage among households with home gardens compared to households without home gardens.

Association between home gardening and number of food varieties consumed

The results obtained from the Chi-square analysis showed that number of vegetable, fruit, yams and tuber, spice and pulse varieties had an association with home gardening (Table 1). Further it revealed that the households with home gardens consume higher number of vegetable, fruit, yams and tuber, spice and pulse varieties than households without home gardens (Table 1).

Discrimination of two food security levels: food secure and food insecure without hunger

Discriminant analysis was used to discriminate the food security levels of the respondents using socio economic factors such as, Age (AGE), Gender (GEN), Education level (EDU), Number of family members (FAM) of the respondent, Number of family members employed (EMP), Main Income source (INCSOU), Monthly Income range (INCRA), Higher prices of food cause inadequacy of food access (HIPR), Medical costs reduces household budget for food (MED), Borrowed any loans (BAL), Non food expenses

range per month (NFE), Savings range per month (SAV) and Food expense range per month (FOOD).

The linear discriminant functions were obtained for the two food security levels; foods secure (FS) and food insecure without hunger (FIWH) for the whole sample. The functions (1) and (2) discriminated 70% of the population correctly and these functions can be used to discriminate the food security levels of the households.

$$FS = - 54.279 + 4.105HG^* + 0.701AGE + 12.502GEN + 8.136EDU + 1.589FAM - 5.163EMP + 8.298INCSOU - 4.186INCRA + 0.413HIPR + 6.224MED + 4.088BAL + 1.508NFE + 4.538SAV - 0.449FOOD \quad (1)$$

$$FIWH = - 56.862 + 5.712HG^* + 0.711AGE + 12.868GEN + 7.765EDU + 1.935FAM - 5.201EMP + 8.677INCSOU - 4.999INCRA + 0.901HIPR + 6.407MED + 3.326BAL + 2.710NFE + 4.356SAV - 0.683FOOD \quad (2)$$

*HG – Home gardening (Yes – 1, No – 0)

These functions can be used to discriminate the households according to the food security level using the socio economic factors. According to the study there is a positive impact of home gardening on the household food security and a positive association between home gardening and food security level. From a home garden a person can generate income as well as save

Table 1: P – Values, Chi-square values and percentages obtained by chi-square analysis for the number of food varieties consumed

Variable	No. / Range	HG %	NHG %	Chi-square values	P Value
No. of vegetable variety range	< 20	27.5	87.5	29.463	<0.0001*
	21- 30	72.5	12.5		
No. of fruit variety range	0 – 2	20.0	55.0	10.453	0.001*
	3 – 6	80.0	45.0		
No. of yams and tuber varieties range	0 – 2	2.5	72.5	41.813	<0.0001*
	3 – 5	97.5	27.5		
No. of spice varieties	4	5.0	2.5	9.079	0.011*
	5	12.5	42.5		
	6	82.5	55.5		
No. of pulse varieties	1	12.5	50.0	15.232	<0.0001*
	2	47.5	37.5		
	3	40.0	12.5		

HG – Households with Home Gardens, NHG – Without home gardens, No. – Number

* Significant at 95% confidence level, No. – Number

resources spent on food items. The study revealed that the general idea of the respondents towards home gardening was positive.

In future studies, the discriminant functions obtained can be used to discriminate households according to their food security levels, using the socio economic factors of each respondent.

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