

Impact of home garden interventions on household access to vegetables for nutrition security in kavreplanchok district of Nepal

Abstract

The study was conducted during 2020-2021 to identify the contribution of home garden interventions towards household access to vegetables amidst COVID-19 pandemic in Nepal. Kavreplanchok district was the selected site of study wherein checklist, focus group discussion and field observation were the major data collection methods. Women in the treatment group participated in home gardening orientation and vegetable gardening activities, however, only data collection was done in the control group. Post-intervention data showed 46% households in treatment group practiced improved organic vegetable gardening technologies as compared to 10.67% in control. Furthermore, annual vegetable requirement met from home garden was 62% in treatment group, while it was only 36% in control group. Similarly, the knowledge on nutrition, home gardening technology and proper handling of vegetables has increased significantly.

Keywords: nutrition security, COVID-19, organic technologies, vegetable home gardening

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Introduction

The COVID-19 crisis has deeply perturbed the socio-economic sectors of Nepal by creating unprecedented challenges that further exacerbated the already existing pressure on food security and livelihoods of the vulnerable households. In collaboration with the Ministry of Agriculture and Livestock Development, WFP conducted a nation-wide phone-based survey to assess the impact of the COVID-19 crisis on Nepalese households, with prime focus on nutrition security and livelihood aspects. The objective was to examine the multifaceted impacts of the pandemic also chiefly identifying profiles of households that were relatively more affected.¹ Food insecurity among low-income and disadvantaged families was found to be a serious problem during the COVID-19 pandemic in Nepal.²

As per nutritionists, the pandemic has rattled the entire nation and grave risks have been wrecked upon the nutritional well-being and survival of underage children. Vegetable home garden seems to be an effective and promising method for maintaining health even during these uncertain times.

Vegetables play a significant role in the human diet, makes it balanced and supplies most of the important natural elements. The nutritional value of vegetables is well recognized as it is a vital source of essential vitamins, minerals, antioxidants and dietary fiber. However, vegetable intake is very low in Nepal due to lack of proper knowledge and awareness among rural people.³ They give low priority to vegetables on their daily use as compared to cereal crops. Due to low consumption of vegetables, malnutrition has become a serious problem in Nepal. Nepal Demographic and Health Survey, 2016 shows that the 36 percent of children under five years of age are stunted, 10 percent are wasted, and 27 percent are underweight.⁴

The global literature recognize positive contributions of home gardens towards enhancing nutrition security for resource poor families in developing countries.⁵ Vegetables from the organic home gardens are good source of micronutrients especially in poor

households. Studies suggest home gardens as a low-cost option to enhance nutritional status of rural people in Nepal.⁶ Similarly, a study from Lao PDR on home gardens concludes it to be an effective and sustainable means of improving nutritional standards of low income families.⁷

In Nepal women have a great role for including more vegetables in human daily food because women are involved in food preparation and serve the families' favorite dishes.⁸ Therefore, essentially more emphasis must be given through the women organizations/groups by researchers to train the women as they have more contribution and accountability towards vegetable production. So, this study was conducted with a women farmer's group to identify the effect of home garden interventions on technology acceptance, awareness and knowledge of nutrition, home gardening techniques and consumption of vegetables.

Methodology

Research was conducted at Mandandepur Municipality, Kavreplanchok district during 2020-2021. Randomized Control Trial (RCT) design was used for the study. In RCT design, 50 interested women were identified. Among those 30 members were selected randomly and divided into 2 groups with 15 members in each group for this research. The first group was treatment group where training as well as vegetable seeds for winter production namely Radish, Cress, Carrot, Broad Leaf Mustard, Cauliflower, Coriander, Turnip, Onion, Broad Bean, Pea, Fenugreek and Spinach were provided. Similarly, vegetable seeds for summer season production were Pumpkin, Sponge Gourd, Bottle Gourd, Bitter Gourd, Cucumber, French bean and Brinjal. Along with these vegetable seeds we also distributed them 50 liter drum, yellow sticky trap, neem based pesticide, EM and waste decomposer to promote organic home garden. Effective micro organisms (EM) is the well-known mixture of natural occurring and beneficial organisms. One of the function of EM is quick decomposition of compost and farm yard manure.⁹ Similarly, waste decomposer developed by National Centre of Organic Farming

(NCOF) is also can be used for quick composting. Average land for home garden was 300 m². Technologies promoted in the home gardens are as follows:

- I. Improved compost (use of EM & waste decomposer)
- II. Improved nursery
- III. Use of liquid manure
- IV. Use of yellow sticky trap and neem based pesticide (organic pest control)
- V. Irrigation (water harvesting & use)
- VI. Own seed saving
- VII. Proper harvesting
- VIII. Cleaning & proper cooking
- IX. Proper hand washing and dietary hygiene.

The home garden orientation training included topics such as home garden establishment, crop rotation, compost making, pest management and seed saving. Similarly, orientation on the role of vegetables for family health, the nutritional content of different food items, and cooking methods to preserve the nutritional quality of vegetables were provided.

Knowledge concerning nutrition, home gardening, harvesting and proper cooking were measured by using 1 to 9 scale suggested by¹⁰ in which 1 indicates the extremely poor and 9 for outstanding

(1=extremely poor; 2=insufficient; 3=below average; 4=average; 5=above average; 6=good; 7=very good; 8=excellent; 9=outstanding). For this, questions related to home gardening & nutrition were answered by the women members. Based on cumulative marks obtained in all questions, knowledge level was estimated. The pre-intervention test was designed, in order to determine the baseline pattern of technological knowledge and nutrition. The post-intervention test period began immediately after one year vegetable gardening cycle was completed. Vegetables were harvested from home gardens 2-4 times every week from July 2020 to June 2021. Before consumption, harvested vegetables were weighted for calculating total yield.

Results

Households practicing home garden technologies

Nine verified organic technologies were promoted in research site (Table 1). Maximum households (58.33%) practiced improved composting technology followed by liquid manure and use of yellow sticky trap and neem based pesticide. However, minimum practice was associated with cleaning and proper cooking (23.33% hh). As organically grown vegetables are cultivated without the use of pesticides and chemical fertilizers, they are less contaminated with pesticide residue.¹¹ Therefore, organic vegetables ensure better nutritional benefits and health safety. In this study technology practicing rate was highly increased within the two vegetable growing seasons. A study of home gardens in Cuba reveals that they were used as a strategy to increase resilience and ensure food security in the face of economic crisis and political isolation.¹²

Table 1 Percentage of households practicing improved home garden technologies (2020-2021)

Technology/intervention	Pre-intervention (Household % practiced home garden technology)		Post-intervention (Household % practiced home garden technology)	
	Control	Treatment	Control	Treatment
Improved compost (use of EM & waste decomposer)	6.33	3.33	6	58.33
Improved nursery	12.33	13	14	48.33
Use of liquid manure	10	7.67	6.33	56.33
Use of yellow sticky trap and neem based pesticide	12.33	11.33	10	55
Irrigation (water harvesting & use)	3	3.67	5.67	38.33
Own seed saving	20	21.67	19	41.67
Proper harvesting	7.67	6.67	10	46.67
Cleaning & proper cooking	10	11.67	10	23.33
Proper hand washing and dietary hygiene	20	21.67	15	43.33
Average households %	11.3	11.19	10.67	45.7

Vegetables availability at household level

An assessment of the home garden intervention in 2020-2021 found a positive effect on vegetable sufficiency at the household level. The findings showed that 62 percent of the vegetable requirements of the rural households was met by home garden products (Table 2). After intervention, household's vegetable production increased by 69% in treatment group and that increased by 4.76% in control group.

Similar study was conducted¹³ in a rural village in Kwa Zulu-Natal in South Africa and found that production of yellow and dark green leafy vegetable in home gardens significantly improved vegetable intake and Vitamin A status of children between the ages of two to five

years. Likewise, a home garden model tested in rural households in Bangladesh has reported reduced expenses on vegetables, improved intake of fresh fruits and vegetables.¹⁴ Home garden interventions have improved vegetable intake, however, there is a need to strengthen their efficiency. Other strategies like capacity building, awareness and sensitization should be adopted.

Participants' knowledge on nutrition, home gardening and proper cooking

Data considering knowledge of treatment group on nutrition, home gardening and proper harvesting and cooking was recorded pre-intervention and post-intervention. Pre-intervention data revealed

that the knowledge of nutrition, home gardening techniques, proper handling and cooking was very poor. However, post intervention data showed that was significantly increased after receiving the home garden treatments (Figure 1). Fresh vegetables are the cheapest source of vitamins and minerals and that are high value food source for poorest family.¹⁵ There is a great need to create awareness among the community people about importance of vegetables in human

nutrition and its losses due to poor handling and cooking. Frying and mashing with lots of spices is also one reason for loss of nutrients.¹⁶ Also drying and heating of fresh vegetables result in the destruction of vitamins and antioxidants. Therefore, women (housewives) need to be made aware about loss of vitamins and nutrients during cutting, washing and overcooking.

Table 2 Vegetable requirement percent meet from home garden (2020-2021)

Period	Pre-intervention		Post-intervention	
	Control	Treatment	Control	Treatment
July –September	53.33	56.67	58.33	81.67
October-December	35	33.33	30.33	60
January-March	26.67	28.33	27.67	53.33
April –June	31.67	30	34.67	61
Whole year	26.67	25	30.67	53.33
Average	34.68	36.67	36.33	61.86

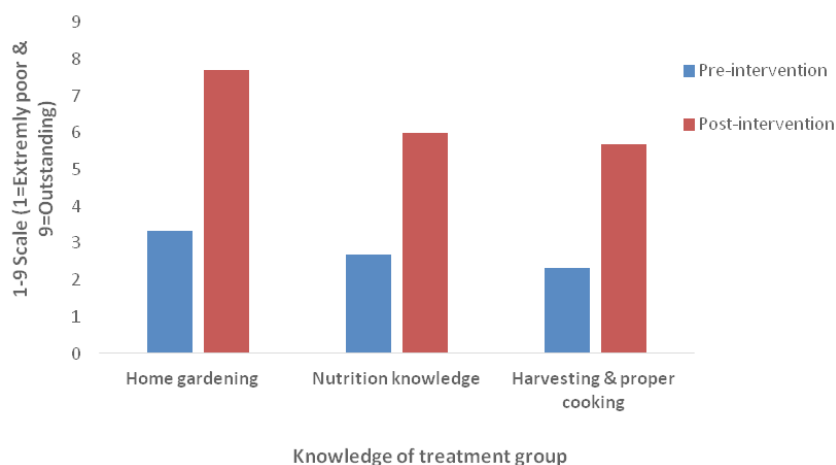


Figure 1 Effect of home garden interventions on knowledge level of participants on nutrition, home gardening techniques, harvesting and proper cooking (2020-2021).

Vegetable yield per household per year

The yield of vegetables in home gardens were recorded from July 2020 to June 2021. Vegetables were harvested from home garden depending upon their stage of maturity. Before consumption, harvested vegetables were weighted for calculating total yield. Home

gardens yielded the maximum 600 kg and minimum 290 kg vegetables annually. Average vegetable yield in treatment group was recorded to be 468 kg per household per year (Table 3). The calculated yield data suggested that home garden (300 m² land) could significantly improve household access to vegetables in Nepal.

Table 3 Average yield of vegetables per household (300 m² land) per year (2020-2021)

SN	Name of women participant	Vegetable production (Kg.)
1	Shiba Kumari Parajuli	550
2	Debaki Timalisina	480
3	Ganga Sapkota	520
4	Gouri Parajuli	570
5	Radhika Sapkota	380
6	Sabitra Parajuli	420
7	Makhamali Timalisina	500
8	Sarmila Timalisina	340

Table Continued...

SN	Name of women participant	Vegetable production (Kg.)
9	Gita Nepal	580
10	Kamala Sapkota	600
11	Sarmila Sapkota	290
12	Sosthani Sapkota	400
13	Dhanakumari Poudel	470
14	Radhika Parajuli	600
15	Jayanti Nepal	320
Average vegetable yield (kg) per household per year		468

Conclusion

Generally, area surrounding the houses is wasted which can be utilized to grow vegetables for fulfilling the requirement of every home. One can make his surroundings fresh and attractive by growing vegetables in home garden. Home garden also helps us maintain our health as working in the home garden is a form of good physical exercise even during the COVID-19 pandemic. If every person learns the technology of using waste land near his house as a home garden, he will be able to provide vitamins and minerals in the form of vegetables which help to improve the health of his family members. However, vegetables should be properly handled before consuming in order to maintain good health. Recognizing the value and potential of home garden in promoting nutrition security, many activities need to be initiated by the Government of Nepal.

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