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## Nutritional kitchen garden: hope in sustaining food and nutritional security: A longitudinal research report

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### Abstract

The contribution of house hold level food processing and now production through kitchen gardens in national food security is remarkable in agricultural system. But unfortunately it has been less assuming the attention of authorities. To focus on impact of integrated scientific efforts in this field, a longitudinal empirical study has carried out under the Krishi Vigyan Kendra (KVK) with 120 households (HHs) from 8 villages of Kanpur Dehat. The study was made in 3 stages: the assessment stage as pre test; intervention and training to development of kitchen garden for income and family nutrition with set up of kitchen garden at the home of 120 selected trainees; post assessment test. The pre test by dietary survey showed that poor consumption of fruits and vegetables were prevalent in families. Demography study revealed that no any side income source has been found that created households conflicts due to work less routine of family members. These conditions and practices were degraded the health and quality of life of families. Under the training the rural HHs, those were able to manage 200 sq. M. space at their house had guided for initiation of kitchen garden and monitored on entire study period.

It was observed that the yields of vegetable and regional fruits are remarkably increases from years 2017 to 2020, and the total yields found highest in Rabi crops (448.25 kg./ season) Therefore, the consumption of these qualitative food cultivated in kitchen garden had significantly increased among the families. The per month mean income Rs. 1034.6 was obtained as economic output from the kitchen garden after minus the investment amount. Apart from that a happiness and prosperity had reported in family environment. The present attempt has focused on productivity, profitability, sustainability and stability.

**Keywords:** Cultivation, kitchen garden, crops, yields, rabi, qualitative food, intervention, training

### Introduction

India is a big producer of fruits and vegetables, but their consumption rate is very poor among the people due to lack of proper supply, distribution and awareness of local availability. These crops can be make available at the home under the management of kitchen garden.

Kitchen garden refers as the utilization of empty space present at backyard of home to growing fruits and vegetables by using kitchen's drainage water. That is why its called as kitchen or home garden and also Nutrition garden or vegetable garden. It supply fresh fruits and vegetables and save the amount that expended from family budget in its purchases. The main aim is food security as well as to prevent the malnutrition prevalent among the families. The diversification in dietary intake can be possible as healthy eating practices through scientifically developed kitchen garden The report of NFHS-4 (2015) has reported that >40 percent stunting cases and under nutrition found in children and >52 percent women are anaemic in the state Utter Pradesh.

Therefore, sustainability in food security by establishing the kitchen or community gardens is a prime demand to maintain the nutritional status of families with side earning for better livelihood. The hypothetical contribution of kitchen garden in food security that people have enough and diverse food that makes their physical, social and economic well being, safe, fresh and nutritious food which meets their dietary needs and food in variety for healthy body and fitness, (FAO 2002) [4].

The rural and urban people should promote to its startup because these nutritional kitchen gardens are generated the household's level food security. As the household level food security is concern: food produces in variety as accordance to harvesting seasons at household level to create healthy eating practices for good family health and financial support. The application of this concept to the family level, with family members, within households is the main aim of the household level food security as kitchen garden concern, (Sanago. D. 2007).

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### Material and Methodology

The area of study has been selected as accordance to the area of Krishi Vigyan Kendra (KVK) of Kanpur dehat. There were 8 villages Roodapur, Aurangabad, Majhiyar, Daheli, Anoopur and Ekghara of Rasoolabad, Maitha and Akbarpur block selected for the investigation and intervention with respondents. The sample households (HHs) were selected from stratified random sampling method under inclusion criteria. The rural HH who has 200 sq. Meter area/ space for developing a kitchen garden were included as respondent HH or family. Total 120 HHs were selected for intervention. A descriptive, longitudinal study has been carried out in three stages as: Pre test investigation; Intervention with development or set up and constant monitoring of their kitchen garden after training of respondents; Post test on selected aspects of investigation.

Survey method was adopted to collect the demographic information and dietary survey carried out using questionnaire tool on pre-post test model. The decided fruits and vegetables crops in Rabi, Kharif and Zaid seasons were harvested for production at the 120 developed kitchen gardens. The crop yields of kitchen garden during all harvesting seasons were recorded by measurements. The data were statistically analyzed using mean values, standard deviation, one way ANOVA, scoring technique and the impact of kitchen garden analyzed.

### Results and Interpretation

After collection of data the reveals of the study have been obtained with the help of statistical analysis. These results are tabulated and presented here as follows:

#### 1. Demography of HHs

Table no.1 presented that most of the HHs (55%) had intermediate or medium families in size, from 8 villages of Kanpur dehat. Family size has been standardized according to modern Sociology, classified as in to three types: Small family- living with 1-4 family members, Medium family- living with 5-7 members, Large family - living with > 7 member

**Table 1:** Classification of HHs according to family size

Family size	N=120	%	Mean ± SD
Small 1-4	32	26.66	3 ± 1
Medium 5-7	66	55.0	6 ± 1
Large > 7	22	18.33	8 ± 1

Table no. 2 shows that majority of families (60%) were belonged to IV class as lower middle income group according to modified scale of Dr. B. G. Prasad (2012), followed by 24.16 percent from V class (poor group). Only 15.8 percent families were found to be in SES class III (middle income group) and no any families belonged from upper middle and higher income groups as class II and I respectively. The families has urgently need to development of secondary or supporting income source trough making a kitchen garden to improve in family income.

**Table 2:** Socio-economic Status (SES) classification of HHs (according to per capita family income)

Socio-Economic Status (SES) class	N=120	%
I (Rs. >5571)	--	--
II (Rs. 2786 - 5570)	--	--
III (Rs. 1671-2785)	19	15.8
IV (Rs.836 - 1670)	72	60.0
V (Rs. <836)	29	24.16

### 2. Crops yields in harvesting seasons

Table no. 3 shows the year wise crop production in all harvesting seasons as total crop yields, it was found on all study years that the production of total selected (20 vegetables and 4 fruits that diverse on every harvest season's) crops had gradually increases every years. On rabi season the mean production of well set up 200 square meter spaced 120 kitchen gardens had 448.35kg on year 2017-18 that increases on 2018 - 19 522.63 kg and 536.45 on 2019-20.

The crop productions of zaid season were found to be comparatively lower than rabi and kharif seasons in all the study years. The mean yield was found 301.5 kg in year 2017-18 that minutely increases in year 2018 - 19 as 309.33 kg. and 321 kg. in year 2019-20. The total crop yields in kharif season on 3 selected years had 442kg, 451.83 kg. and 450.66 on 2017 - 18, 19 and 2020 respectively. These findings has prove that the proper care by training and harvesting experience used in kitchen garden can affects as good impact in total crop yields.

**Table 3:** Mean value of vegetable crop yields of 120 Kitchen Gardens

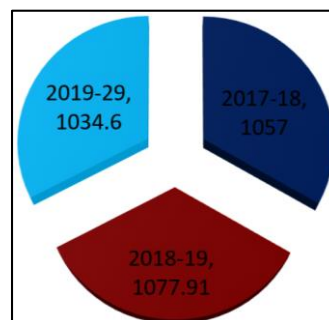
Years	Mean of vegetable and fruit Crop yields (kg) on different Harvesting Seasons			
	Rabi	Zaid	Kharif	Total (kg)
2017 - 18	448.35	301.5	442.0	1191.85
2018 - 19	522.63	309.33	451.83	1283.79
2019 -20	536.45	321.0	450.66	1308.11

The table no. 4 presented the earning of total vegetables and fruits by selling after minus in household consumption and investment, that was obtained as Rs.41,548.59 that increases significantly at 0.05 level i.e. Rs 42,587.72 in year 2018 - 19 and Rs. 43,963.82 in year 2019 - 20. The total income was found to be increasing level due to better performances and care of kitchen garden provided in HHs due to increasing interest from previous year's yields. The income in rabi season in all years were found to be significantly higher than other season at 0.50 significant level. The income of zaid season in all years had increased but at non significant level whereas significantly increased in kharif season in all years.

**Table 5:** Mean Income (per year) from crops of vegetables and fruits yields from kitchen garden

Harvesting Seasons	Per year mean income from crop yields of 120 Kitchen Gardens (Rs.)			p-value
	Year 2017 - 18	Year 2018 - 19	Year 2019 - 2020	
Rabi	4567	3998	3860	<0.001
Zaid	3421	4025	4200	0.003
Kharif	4110	5062	4670	<0.001
Total (Rs.)	12098	13085	12730	<0.001

**Note:** <0.001 indicated that significant differences on 0.05 level.



**Fig 1:** Average monthly income from kitchen garden during study period

### 3. Impact of Nutritional (kitchen) garden on Food consumption pattern of families

The pre- post investigation has revealed the data on the impact of Nutritional kitchen garden on consumption pattern of families that assessed by pre- post adult consumption, showing in Fig 2. The table shows that cereal consumption among the respondents was higher than their RDA in pre-test but it decreased non significantly at 0.05 level. Pulses and legumes intake were poor which increased significantly at 0.05 level due to better intake of fresh peas, mushrooms and groundnuts in daily diet. The daily intake of vegetable and

fruits were increased significantly at 0.05 level on p-value <0.001. Consumption of roots and tubers had not significantly decreases in daily intake of respondents.

As the impact of production of food at HHs, the qualitative food (vegetables, fruits, legumes) consumptions were significantly increases and quantitative food (cereal, millets, roots and tubers) consumption non significantly decreases in daily diet of families. That is good healthy and fitness oriented dietary practices concern with households food security.

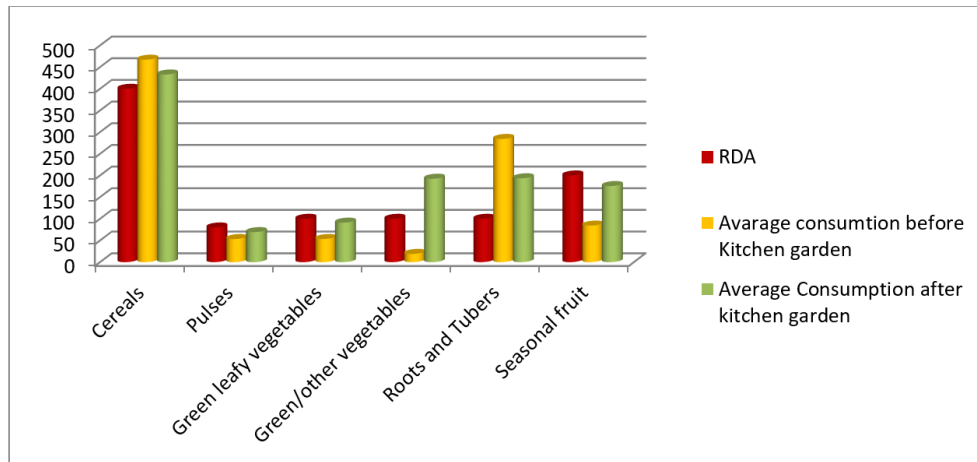


Fig 2: Pre-post impact of kitchen garden on food consumption

The results concluded as the study revealed that due to medium size family and mostly belonged to lower middle income groups with poor dietary pattern, the rural HHs were needed to guidance of kitchen garden as income support measure as well as an availability of a diversified pattern of food for healthy living. Growing in enough amounts of legumes, vegetables and fruits to feed the entire family and remaining amount to selling has come in practice of HHs. after keen scientific supervision during study period. Diversity in crops has been observed due to scientific gardening in different harvesting seasons. The maximum crop yields/ production was appeared in rabi season. The yields and income had gradually increases in selected study years. The healthy food consumption was seen in post test reveals that showed a best impact of kitchen garden in better dietary practices.

Therefore, home gardening contributes to household food security by providing direct access to food to the family members. There are an integrated and scientific efforts needed to aware the rural HHs to development of kitchen garden with a scientific manner to produce high yields in small space of households.

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