



## AWARENESS ON ORGANIC HOME GROWN VEGGIES AND PREFERENCE TOWARDS IT AN EMPIRICAL ANALYSIS CONSIDERING THE HARMFUL EFFECTS OF CHEMICALS USED IN NON-ORGANIC VEGETABLE CULTIVATION

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### Abstract

Most recently, the ever-increasing trend in agriculture has been towards large-scale, chemical-based farming. Harmful chemical fertilizers, non-degradable pesticides and herbicides have destroyed the life of the soil, causing widespread erosion and sterility and affect the human health indirectly. Organic agriculture enriches the soil season by season. It increases the long-term yield, nutrient value and potency of the crops. It allows for a naturally clean water supply, and provides overall richness, health and well-being of their families, livestock, farmlands and communities. The recent human community has come out with the innovative concept: "growing the own vegetables and fruits", this concept has gained a good reputation and the results give a positive impact towards health and activity. Growing own vegetables is both fun and rewarding. All really need to get started is some decent soil and a few plants with a few area of space, even the terrace garden for most small housed people. People take an interest in gardening for a variety of reasons—higher quality produce, exercise in the great outdoors, or saving money. Whether you hope to discover your green thumb or save a little green, growing your own fruits and vegetables can be an advantageous pastime. When you're just getting started, gardening can be intimidating. In this research article we try to see the desperate change that has been advancing in the area organic vegetables & fruits from free available home space. The data has been collected with an accurate and reliable questionnaire. A factor analysis is used to club the various listed factors into apt headings. The reliability of the questionnaire has been tested with Cronbach Alpha with a value of .812 which is highly accepted. KMO (Kaiser-Meyer-Olkin) and Bartlett's test is accepted with a positive Chi-Square value of 297.695, were as the Eigen values for factor analysis is more than 1 for those items which has been accepted and the factors have been rotated and those factor which has significant loadings (more than 0.40) are taken for the study conclusion.

Keywords: Organic Farming, Natural Taste, Healthy and Chemical-Free, Saves Money.

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## INTRODUCTION

It might seem crazy to start thinking about a vegetable garden. But believe it or not it is the perfect time to begin preparing for a successful harvest. There are a few balancing and rewarding ways to spend an hour or two a week than growing even a few of your own vegetables. No fruit or vegetable is as fresh as one that need only travel from your backyard to your fork. Most supermarket produce is picked early to extend shelf life and may be weeks, if not months old, affecting both flavour and nutritional value. Commercially produced fruit and vegetable are expensive, not surprising when you consider many have travelled thousands of miles to reach your plate. Good nutrition helps children grow, develop and learn. Home gardening provides a wealth of benefits to children and families.

It provides exercise, promotes healthy diet choices and will instill a sense of respect, awe and appreciation of the natural world. Growing own vegetables and fruits will be a fun filled activity too.

## MATERIALS AND METHODS

The data were collected from the respondents using a simple random sampling method for this research study. The filled up questionnaire were thoroughly checked and ensured accuracy, consistency and completeness of data. The data thus collected were categorized and processed manually and further it was crosschecked through computers. The primary data are collected through questionnaire survey.

The respondents are asked to give their opinion relating to their preference towards organic vegetable growing and awareness about health hazards on consuming vegetables which are cultivated using chemicals. The validity, reliability was analyzed using Cronbach's alpha which was .812 and showed that the framed set of questions were positive for the study to proceed further. The data in this study was analyzed using the statistical package for social sciences (SPSS 21.0)

### Statement of the Problem

Modernization and industrialization has significantly affected the life of humans in ever sphere including food and vegetation. Reduction in available land for agriculture practises increased the stress on these sources to produce more crops to sustain the food needs of an ever growing population. Need and greed of humans along with advancements in science and technology made farmers to use more chemical fertilizers to increase yield in the last few decades. Prolonged use of chemical fertilizers and their subsequent incorporation in to vegetables and fruits has significantly contributed to severe health hazards ranging from dehydration to several types of acute toxicity syndromes.

Concern on health and food being an inevitable part for ever living being is increasing day by day. Scientists, environmentalist and even the management field now emphasises on creation of kitchen gardens and terrace gardens to meet the routine food needs of the family. This could prove as a method of self-sustainability along with the milestone for a healthy and eco-friendly life style. This research work addresses the concern regarding use of chemicals in vegetables and fruits, associated health hazards and final emphasises on the importance of 'home grown veggies'.

### Future Scope of Research

The major scope of the study involves screening for eco-friendly methods for sustainable human development. The current research work also highlights a new perspective of organic farming within house premises as the ultimate method to tackle the increasing demand for fruits and vegetables.

The research further emphasises on farming without chemicals for reducing health hazards associated with incorporation of chemicals in food. Ultimately the scientific investigation is a statistical approach that signifies the need to go green to save environment and humanity.

### Objective of the Study

- To assess the health hazards associated with intake of chemical toxins present in vegetables
- To highlight the importance of kitchen garden at home and to suggest the same for a healthy living

### Factors Affecting Nutritional Profile of Vegetables

Nutritional compositions of vegetables are influenced by a variety of factors that varies from one geographical location to another. Climatic conditions, especially temperature and light intensity, have a strong effect on the nutritional quality of fruits and vegetables. Soil type, the rootstock used for fruit

trees, mulching, irrigation, fertilization, and other cultural practices influence the water and nutrient supply to the plant, which can affect the composition and quality attributes (appearance, texture, taste and aroma) of the harvested plant parts (Goldman et al., 1999). Maturity at harvest and harvesting method influence the commodity's quality and extent of physical injuries. Delays between harvest and consumption or processing can result in losses of flavor and nutritional quality. The magnitude of these losses increases with exposure to temperatures, relative humidity's, and/or concentrations of oxygen, carbon dioxide, and ethylene outside the ranges that are optimum for each commodity during the entire postharvest handling system (Lee and Kader, 2000). Furthermore, processing and cooking methods can greatly affect the nutritional value of fruits and vegetables.

### Review of Literature

Fruits and vegetables are integral part of human diet as they not only provide essential nutrients to humans but also prevent the risk of cardiovascular disease, cancer and obesity (Keikotlhaile *et al.*, 2011). In order to reduce the post-harvest losses associated with vegetable cultivation farmers resort to use more chemicals in agriculture. The use of pesticides have increased because they have rapid action, decrease toxins produced by food infecting organisms and are less labor intensive than other pest control methods. However, the use of pesticides during production often leads to the presence of pesticide residues in fruits and vegetables after harvest. The presence of pesticide residues is a concern for consumers because pesticides are known to have potential harmful effects to other non-targeted organisms than pests and diseases. The major concerns are their toxic effects such as interfering with the reproductive systems and fetal development as well as their capacity to cause cancer and asthma (Gilden et al., 2010). Pesticide legislation in developing countries is generally lacking or not implemented and this also affects pesticide monitoring since it relies on legislation to be effective (Ecobichon, 2001). Fruits and vegetables like other foods pass through culinary and food processing treatments before they are consumed. Effect of processing in fruits and vegetables are said to be influenced by the physico-chemical properties of the pesticide as well as the processing method (Holland et al., 1994). The highest dose of the pesticide that does not cause detectable toxic effects on the test organisms is called the no-observed-adverse-effect-level (NOAEL) and is expressed in milligrams per kilogram of body weight per day (WHO 1997).

### Chemical usage in Vegetables

Due to the great gap between need and production of vegetables, farmers generally prefer to use chemicals to increase production per acre of land and shelf life of the produced vegetables. This practice was routinely done without knowing the health hazards associated with these toxic chemicals or sometimes ignoring these facts intentionally to earn more profit. Pesticides are chemical or biological agents that are used to prevent pest infestation. Chemicals are also used to improve shelf life and to modify the appearance and texture to gain attention of public. Some of the applications and toxic effects of chemicals used in the commercial cultivation of vegetables are enlisted below:

**Table No 1.0. Demographic Analysis of Respondents**

Gender	Frequency	Percent
Male	152	76.0
Female	48	24.0
Total	200	100.0
Age	Frequency	Percent
Up to 20 years	97	48.5
21-25 Years	55	27.5
26-30 Years	40	20.0
Above 30 Years	8	4.0
Total	200	100.0
Marital Status	Frequency	Percent
Single	109	54.5
Married	91	45.5
Total	200	100.0
Educational qualification	Frequency	Percent
Up to HSC	45	22.5
UG	97	48.5
PG	40	20.0
Professional	18	9.0
Total	200	100.0
Occupation	Frequency	Percent
Salaried	78	39.0
Business	38	19.0
Professional	40	20.0
Retired	24	12.0
Home maker	20	10.0
Total	200	100.0
Monthly income	Frequency	Percent
Up to Rs.25,000	60	30
Rs.25,001 -50,000	40	20
Rs.50,001-75,000	60	30
Above Rs.75,000	40	20
Total	200	100

### Interpretation for the above Demographic profile of the respondents

The above analysis with regard to gender reveals that for gender wise distribution of respondents. Out of 200 respondents, 76 % of respondents were male and 24 % of respondents were female. In case of age of the respondents it can be inferred that 48.5% of the respondents belong to the age group of Up to 20 years. 27.5% of the respondents belong to the age group of 21 – 25 years, 20% of the respondents belong to the age group of the above 26-30 years, and the remaining 8% of the respondents belong to the age group of above 30. With regard to the marital status it is clear that 54.5% of respondents were single and 45.5% of respondents were married which shows the marital status. With regard to educational qualification wise distribution of respondents. The majority 48.5% of the respondents were in U.G qualified customers, and 22.5% of the respondents up to HSC qualification, 20 % of the respondents were in the PG qualification finally 9% respondents were in the professional qualification.

### Health Awareness Due to Chemical Content in Non Organic Vegetables

**Table No 1.1 Diphenylamine it imparts luster to the skin**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	98	49.0	49.0
	No	102	51.0	100.0
Total	200	100.0	100.0	

**Table No 1.2 Fumigants capable of inducing cancer and hormone disruption in children**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	67	33.5	33.5
	No	133	66.5	100.0
Total	200	100.0	100.0	

In case of Occupation wise distribution of respondents. Majority 39% of respondents were salaried, 20% of respondents were Professional and 19% of respondents were Business. 12 % of respondents was retired and 10% of respondents were Home maker. The percentage analysis for monthly income wise distribution respondents shows that 30% each of the respondents were less than Rs.25000/- monthly income, 20% of them were Rs.25001-50000 monthly income, 30% of the respondents monthly income Rs.50001 – 75000 and remaining 20% of the respondent's income were above Rs.75,000.

### Reliability test

Since this research has utilized proper linkert -type scale it is important to test the internal consistency and the reliability of the questionnaire and thus we employ a Cronbach's alpha test. A total of 15 scale constructs were tested for reliability and the below table clearly shows that the set of constructs used in this study is perfect and highly reliable. The above table shows the sample adequacy test by KMO (Kaiser-Meyer-Olkin) and Bartlett's test. KMO compares the size of the observed correlation coefficient were the size of the partial correlation coefficient for the sum of analysed variables is 85.4% and is considered to be reliable and thus the research can be proceeded with factor analysis. On the other hand the Bartlett's test of sphericity (Ho 1 All correlation coefficients are close to zero) is rejected as the level of significance ( $P < 0.0005$ ) for Approx. The chi-square value is (297.695) and all the coefficients are not close to zero and thus the second acceptance is strong to proceed with a factor analysis as it satisfies both the test to conduct a complete factor analysis.

### Factor analysis

The first and the foremost initial process in factor analysis is to determine the linear components within the data set i.e., the Eigen values by calculating the Eigen values for R-matrix. SPSS extracts factors which has values more than 1 which is acceptable. Principal component analysis is an important technique to determine the strong patterns in the data set and an important instrument for data reduction is followed. The initial value is 1 by definition and extraction values are more than .5 is usually accepted. In this research the extraction values are high i.e., more than .5 which indicates the proportion of each variables variance. We now proceed with the total variance table.

### Interpretation for factor analysis

Finally the rotated component analysis is used to shows the factor loadings for each scale construct.

**Table No 1.3. Chlorpyrifos it is used in leafy vegetables affects brain development in children**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	97	48.5	48.5	48.5
	no	103	51.5	51.5	100.0
Total		200	100.0	100.0	

**Table No 1.4. Neonicotinoids causes nerve damage**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	49	24.5	24.5	24.5
	no	151	75.5	75.5	100.0
Total		200	100.0	100.0	

**Table No 1.5. Endosulfins can pose a danger to central nervous system.**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	85	42.5	42.5	42.5
	no	115	57.5	57.5	100.0
Total		200	100.0	100.0	

Reliability Statistics	
Cronbach's Alpha	N of Items
.812	15

**Sample adequacy test and sphericity test**

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.722
Bartlett's Test of Sphericity	Approx. Chi-Square	297.695
	Df	45
	Sig.	.000

Communalities		
	Initial	Extraction
Good taste and no Chemical flavour(q1)	1.000	.390
Good satisfaction at the end of the meal(q2)	1.000	.664
Keeps me occupied(a3)	1.000	.924
Ensure that my kids consume fresh vegetables and fruits(q4)	1.000	.500
Saves money(q5)	1.000	.967
Having a strong control on health(q6)	1.000	.749
From flowers to vegetables i cultivate(q7)	1.000	.960
Selling it to peer groups too(q8)	1.000	.889
using farmyard manure(q9)	1.000	.922
natural organic plant protection methods(q10)	1.000	.892
zero-tolerance policy towards use of any chemicals(q11)	1.000	.922
business of dealing with organic gardening products/ services(q12)	1.000	.621
promote use of any packaged organic products(q13)	1.000	.909
falling back on traditional farming knowledge(q14)	1.000	.693
Knowing to cultivate my own vegetables and fruits(q15)	1.000	.641

Extraction Method: Principal Component Analysis.

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.224	21.495	21.495	3.224	21.495	21.495	3.128	20.855	20.855
2	3.105	20.698	42.193	3.105	20.698	42.193	2.869	19.130	39.985
3	2.769	18.459	60.652	2.769	18.459	60.652	2.827	18.848	58.833
4	1.501	10.009	70.661	1.501	10.009	70.661	1.524	10.159	68.992
5	1.042	6.948	77.609	1.042	6.948	77.609	1.293	8.617	77.609
6	.875	5.830	83.439						
7	.716	4.770	88.209						
8	.687	4.581	92.790						
9	.417	2.779	95.570						
10	.297	1.980	97.550						
11	.252	1.680	99.230						
12	.092	.615	99.845						
13	.020	.130	99.976						
14	.004	.024	100.000						
15	-2.167E-016	-1.444E-015	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix <sup>a</sup>					
Scale items	Component				
	1	2	3	4	5
Natural organic plant protection methods	.930	-.042	.064	.109	-.092
Selling it to peer groups too	.928	-.038	.069	.114	-.092
Having a strong control on health	.757	.205	.012	.361	-.054
Good taste and no Chemical flavour	.610	-.039	.040	-.094	.075
From flowers to vegetables i cultivate	-.095	.968	.103	-.058	.019
Saves money	.203	.955	-.110	-.029	-.030
Keeps me occupied	-.081	.954	-.072	.041	.026
zero-tolerance policy towards use of any chemicals	.084	-.028	.955	.017	.049
using farmyard manure	.084	-.028	.955	.017	.049
Good satisfaction at the end of the meal	.022	-.013	.811	.069	.013
business of dealing with organic gardening products/ services	.095	-.187	-.014	.759	.013
Ensure that my kids consume fresh vegetables and fruits	.204	.165	.056	.629	.180
falling back on traditional farming knowledge	-.469	-.027	.446	.521	-.046
promote use of any packaged organic products	.040	.010	-.032	.036	.951
Knowing to cultivate my own vegetables and fruits	-.336	-.002	.323	.323	.566

Extraction Method: Principal Component Analysis.  
Rotation Method: Varimax with Kaiser Normalization.  
a. Rotation converged in 5 iterations.

Component Transformation Matrix					
Component	1	2	3	4	5
1	.948	.271	-.017	.126	-.106
2	.121	-.460	.822	.289	.123
3	-.232	.844	.439	.125	.159
4	-.029	-.037	-.361	.734	.573
5	.177	-.035	.043	-.588	.787

Extraction Method: Principal Component Analysis.  
Rotation Method: Varimax with Kaiser Normalization.

Based on the highest factor loadings each the following names have been given.. The factors have been rotated so that each factor has significant loadings (more than 0.40) ideally with not more than one variable. The method for rotation used here is the Varimax procedure. This is an orthogonal method of rotation that minimizes the number of variables with high loadings on a factor, thereby enhancing the interpretability of the factors. On the basis of Table, 5 components were identified for the 15 variables. Based on the item loadings, these factors were respectively labelled as follows:

- The factor “Health Importance” explains the 1<sup>st</sup> component.
- The factor “Saves money & self interest” explains the 2<sup>nd</sup> component.
- The factor “Say no to chemicals” explains the 3<sup>rd</sup> component
- The factor “Satisfaction in all terms “explains the 4<sup>th</sup> component
- The factor “Learning cultivation” explains the 5<sup>th</sup> component

## Conclusion and Key Recommendations

### CONCLUSION

From the above analysis it is clear enough that though people are aware of the hazards of using Non-organic vegetables and they are now growing vegetables in their home garden due to five importance factors such as –Health importance, saving money, spending leisure time in garden and learning cultivation techniques thus preference towards growing the own home garden vegetables is a slowing growing concept and a trendy leisure activity.

Youngsters who belong up to the age of 20 years are involved in this own garden concept is quite interesting to know were as on the other hand side the male gender is more seen in this growing your own vegetable concept when compared to the female gender. With regard to the marital status it is clear that 54.5% of respondents were single, gone the olden days ; the new days has been bestowed with useful thoughts and creativity which has shown positive impact almost in all the fields and has given prime importance to agriculture. The research estimates the prevalence and exposure of various chemicals and intoxicating agents in fruits and veggies. The associated health hazards accelerate the importance of organic farming practises as the ultimate answer to solve the issues relating to inorganic farming.

### Key Recommendation

This generation can follow such health habits of growing their own vegetables so that it helps them to know the techniques of cultivation and on the other hand side it motivates them to spend their time in a useful way in their home garden. Emotional state of a human being can be equalized by spending time with plants which is proved by many previous researchers can be undergone once when a person spends time with plants.

Concerned of health and kids health is so important in this chemical consumption era, thus people must try to give importance to these types of healthy habits. Being a part of the society it's the ultimate duty of every individual to safeguard environment and its subjects. Organic farming and kitchen garden at home can offer a sustainable shift towards healthy eating habits. Commercialisation in home garden creation with the involvement of corporation, state and central government

can encourage the youth to participate effectively in the movement to a greener tomorrow.

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