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Kitchen Gardening and its Economic Significance: A Case Study of Itahari Sub-Metropolitan City

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Abstract

The present investigation was carried out to understand urban farming, in terms of the contribution of such farming in the economy of households of Itahari. One form of urban farming, kitchen gardening, is increasingly used in many locations. However, very few studies have been conducted to investigate the economic aspect of engagement in this activity. This article aims to fulfill this gap in knowledge. Using survey method to collect data and quantitative approach to analyze it, this study examined the economic as well as social aspects of kitchen gardening. It was found that married-females-having-secondary-education were largely involved in gardening. The gardeners carried positive perception about urban farming, and its contribution in improving conditions of the households. That is to say, family gardening can be seen as sustainable, diversified, and important practice. Hence, appropriate attention needs to be given due consideration by scholars and policy-makers. Based on this result, it is recommended that the kitchen garden program should be scaled-up and further expanded in other parts.

Keywords: Kitchen gardening, Cost benefit analysis, Economic significance, Future prospect

Background of the Study

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It is difficult to say the exact date when kitchen gardening began; but, it can be said that since early times a small area near to houses were used for growing a variety of vegetables. For instance, the *Vedas* have records of the oldest repository of human knowledge and utilization of plants as the medicine. Among the four *Vedas,* the Atharav-veda, known as an Aryurveda the 'science of life,' combines herbal medicine, dietetics, psychology and spirituality to provide therapeutic system (Joshi & Joshi, 2005). Those having knowledge of medicinal plants, particularly Vaidya, used to keep medicinal plants near by their cottage. Similar to the countries in the East, monks and nuns in the West used to grow necessary herbs in specialized gardens during the medieval period. Plants such as mint, basil and aloe were kept in the garden. It was believed that the place where basil is grown, no evil is found. A few centuries later, *i.e.*, during the Second World War many families are believed to have kitchen gardens. People called such gardens victory garden as they provided food during war time.

In the countries of Indian subcontinent, the history of kitchen garden is associated with people of lower caste; it is believed that poor and low caste people started kitchen garden as they did not possess separate cultivable land. But, production from kitchen gardens rarely conferred self-sufficiency; the same is true even now. Often, the productions are means to supplement purchase from market. Yet, this does not mean that kitchen gardens have no significance. Their importance is yet to be recognized as a small number of scholars only have paid attention to this area.

The home garden, literally known in Nepali as *Ghar Bagaincha*, refers to the traditional land use system around a homestead, where several species of plants are grown and maintained by household members and their products are primarily intended for the family consumption (Sthapit, Gautam & Eyzaguirre, 2002). Nearly 72% of households have home gardens of an area 2-11% of the total land holdings (Gautam, Sthapit & Shrestha, 2006). Plants in home gardens are typically cultivated with a mixture of plants that can be harvested on a daily or seasonal basis. Given the fact that the size of kitchen gardening is small, they have largely remained neglected.

Available studies have pointed out the role of the gardens not only in multiple fronts (Sthapit, Gautam & Eyzaguirre, 2004) but also in specific areas such as conserving a wide range of unique genetic resources for food

and agriculture (Subedi *et al.*, 2004), contributing to the dietary diversity of local communities (Gautam, Suwal & Sthapit, 2008). Other usefulness pointed out by scholars include food security, nutrition and a cash income, fodder, firewood and timber, spices, herbs and medicinal plants, green manures and pesticide crops and cultural and religious uses.

Very limited studies have contributed to understanding economic aspect of kitchen gardens. A baseline study carried out in four sites of the home garden project in Nepal revealed that the contribution of fruit and vegetables to the total meal of a household is about 44%. It is also found that home gardens provide 60 % of the household's total fruit and vegetable consumption (Gautam, Sthapit & Shrestha, 2006).

To address the lack of available studies on economic aspect of kitchen gardening in the context when such gardening is accepted as microeconomic activity, this study aims to analyze the importance of kitchen gardening on the households of Itahari sub metropolitan city. Particular questions of concern include:

a. How is kitchen gardening practiced in rapidly urbanizing part of Itahari sub-metropolitan city?

b. Why are families engaged in kitchen gardening?

c. To what extent has the garden contributed in the economy of household?

Materials and Methods

This subsection presents the research design and methodologies used in this study. These component include: the research design, site description, sample size, data collection techniques and data analysis. This study is based on field research. Because of its exploratory nature, the research generates qualitative data, some of which can be quantified for quantitative study.

The present study relies largely on primary data. The data was collected during the field study by using different tools and technique such as interview/structured questionnaire etc. The secondary data was taken whenever needed from different economic survey.

Sample size and study area

The study was carried out in the household of Itahari sub metropolitan city. Two locations – ward number 2 and 8 – were selected given the fact that these were the most densely populated areas. Households were selected through snowball sampling. Before the final questionnaire was administered, piloting of the questionnaire was done. The sample size was 60 households.

Itahari is a city located in the Sunsari district (province no.1) in the Koshi Zone of south-eastern Nepal. The latitude and longitude of Itahari, Nepal is 26° 40' 0" N / 87° 17' 0" E. The city is a Sub-Metropolitan and largest city in Sunsari District in the Koshi Zone of south-eastern Nepal. It is located at the main transportation junction of eastern Nepal. It is the center of the east-west Mahendra Highway and north-south Koshi Highway. The city lies between major cities in the east such as Biratnagar, Dharan, Damak and Inaruwa. In 2071 BS, 16th of Mangsir Itahari was declared as sub-metropolitan city combining the VDCs like Khanar, Ekamba, Hasposa and Pakali.

Itahari was selected for this study for various reasons. Firstly, it is a metropolitan city in Nepal where cultivable lands are shrinking due to rapid urbanization. In a sense, the city is representative example of land-shrinking-city due to rapid urbanization. Secondly, the city was chosen due to growth of urban farming for the past one decade. Geologically, the district is in Terai formations, and thus it is in relatively flat area. The soil of the city is more alluvial. The soil is predominantly black, which is suitable for cultivation. Thirdly, the climate is tropical. The mean maximum and minimum temperature varies between 35 °C (95 °F) and 18 °C (64 °F). The climate is hot humid in the summer but dry and cold during winter. The average annual rainfall is 700 mm/year. The major portion of the rainfall is obtained from south- west monsoon that prevails from June to August. Slight winter rain is obtained in February-March. Thus, the climate and rainfall is suitable for kitchen gardening.

Data collection and analysis

The data was collected by using the tools through questionnaire and interview. From each household, one member who is engaged most actively

in kitchen gardening was selected. Each respondent was informed in advance about the purpose of the study and written consent was collected. The questions were related to investment in the kitchen gardening, quantification of the price for the produced goods based on their market value.

The main target groups were household engaged in vegetable production and marketing. For this study a well design questionnaire was developed with the help of expert and it was pre-tested. Primary data were collected with the help of a questionnaire. Sixty respondents of the selected household were interviewed. The respondents were interviewed in their houses and at their farm. These places were selected for the convenience of respondents and for creation of suitable situation, where both sides (researcher and respondent) exchanged their views frankly and informally. The questionnaire was designed in English but the questions were asked in local language (Nepali) in order to avoid confusion. During interview every effort was made to explain the questions and its purpose, so that correct and reliable information easily obtained.

Semi-structured face to face interviews were used as the major method of information gathering. This interview technique allowed the collection of both quantitative and qualitative in-depth information and supported open-minded, participatory research. The semi structure interview allowed the respondents to direct the flow of the conversation and communicate their own ideas rather than being directed by predetermined answers. This provided enough flexibility to discuss aspects that might not have been considered by the researcher but which were important to the respondent. Hence, questions on benefits of urban farming were collected as open ended questions. Each interview lasted approximately forty-five minutes and all the questions were asked at the same interview. The collected data sheets were screened to avoid inadvertent inclusion of incomplete data. After preliminary screening, data were entered into the excel file which was used for further statistical analysis.

Household survey (HH Survey)

HH Survey was conducted to each and every member of the groups under study. Before the survey, preliminary planning including familiarizing with the study area, and decisions about inclusion criteria was finalized. And,

before the actual survey was carried out, pilot study was done. The HH survey form is included in Annex.

Focus group discussion

The entire respondent related to kitchen gardening were considered as focus group. The focus Group Discussion was conducted to extract the data relevant to the study. The discussions were conducted at various levels. It was conducted with the members of the kitchen garden, with key persons of village/tole during interview.

Data processing

The data obtained from field visits was checked for their completeness and reliability. Following this process, the data was organized based on their qualitative and quantitative nature. After collecting the data, editing and processing was done. Different statistical tools were used as shown in appendix. The qualitative data were analyzed through Microsoft XL software whereas the qualitative data were analyzed through content analysis.

The study applied both qualitative and quantitative methods of data analysis. Quantitative data was coded and summarized in tables and analyzed in frequencies. Microsoft Excel 2007 was used to analyze quantitative data. Simple statistical tools like mean, average, pie-charts, bar diagram, histograms, were used to analyze the data collected from primary and secondary sources. Findings are presented in tables, narratives and bar charts.

Qualitative data was analyzed by screening all the notes taken and presented in narratives where necessary. In many areas the qualitative data was used to give meaning to the findings to the quantitative data. The data were analyzed through descriptive statistics and presented in simple methods such as tabulation, chart graphs etc. Finally, it was used to measure the economic performances of gardening, Benefit Cost Ratio (BCR), will be used. The BCR is calculated using the formula:

$BCR = B_t / C_{t.}$

Where,

B_t represents benefits of the project (in certain time)

C_t represents costs of the project (in certain time)

When BCR is greater than 1, it indicates the project is profitable; and a ratio lesser than 1 indicates that it is unprofitable.

Results and Discussions

This subsection presents the research findings obtained from 60 respondents who worked in the kitchen gardens of households in Itahari Sub-Metropolitan city ward numbers 2 and 8. It also includes information from focused group discussions and Key informant interviews as well as secondary data from stake holders.

Demographic characteristics and kitchen gardening

Gender wise, the engagement of women was observed to be higher than that of men. Slightly more than 43% of men were handling kitchen garden and nearly 57% of the gardens were handled by women. The finding did not show any involvement of third gender in this enterprise. Clearly, it showed that women handled kitchen gardening. This finding is similar to the observation made by All-Mamun *et al.* (2010) in their study of homestead vegetable cultivation carried out at Raichow village of Comillia district in Bangladesh. Though the difference in the number of male and female is not very high, it indicates that women are involved more than men in kitchen gardening. This can be due to traditional understanding of work division wherein female are more associated with inside house activities.

In terms of marital status of the participants, an overwhelming majority (95%) was married people; the share of unmarried was 3.3%; and those widowed made up 1.7%. Other two categories, namely separated and divorced were not found among the participants. This can be interpreted as non-significant engagement of unmarried people in kitchen gardening.

In terms of age group, it was found that majority of the workers fall in the so called youth group with respondents aged between 31 and 40 years making a total of 35% of the respondents. Nearly 22% were aged 41 to 50; and the same percentage was from 51 to 60. 16.6 % were above 61 years. Only 3.3% were of the group aged 21 to 30. Very less, that is, 1.7% were aged below 20 were found to be involved in kitchen gardening. The observation of this study is similar to the conclusion made by Rahman (2008). Rahman had observed most of the respondents coming from middle aged group in the study on kitchen gardening and its contribution to food security in Bangladesh.

As seen in **Figure 1**, the declining trend of graph in the both sides of age group 31 to 40 is an interesting phenomenon. This demands further study to examine if after certain age people lose fascination towards kitchen gardening.

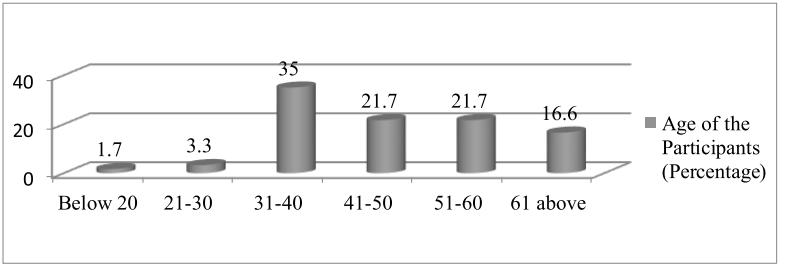

Figure 1: Age wise distribution of the participants

Regarding education level of the participants, majority of the respondents (37) which is 61.7%, had the secondary level of education. 18.3% (11 participants) had primary, 16.7% (10 participants) had tertiary courses, while 3.3% (2 participants) had only pre-primary education. The involvement of very high number of participants with secondary level of education in kitchen gardening can be suggestive of the fact that higher education level is likely to ensure higher engagement in the profession. This observation differs from that of Rahman (2008) in Bangladesh. Unlike the majority of participants from secondary level in the present study, Rahman found most of the respondents coming from primary level education.

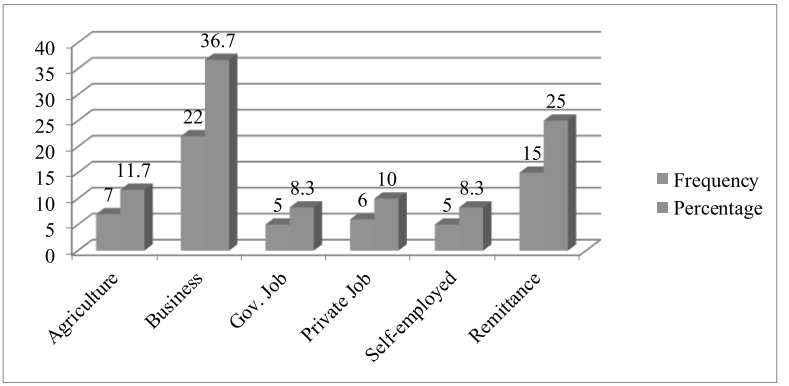

Figure 2: Major source of family income

In terms of family income, it was found that a large share of the respondents had their business (nearly 37%) as major source of income. 25% reported remittance as their source; 11.7% said their major source to be agriculture; 10% answered private job; and 8.3% said their source of income was both government job and employment in private institutions (see **Figure 2** above).

It is clear from the figure that people having business and remittance as main source of income covered up more than 60% of the kitchen gardeners. This can be because women members of business doing families and remittance receiving families use kitchen gardening as their alternative resource. The fact that kitchen gardening is not practiced by job holders is a unique observation; this needs further studies to find out the reasons.

In terms of the span of engagement, it was found that the largest number (24) of participants had experience of 6-10 years of working in the garden. 15 participants reported that they had 11 to 15 years of experience; 12 participants had above 20 years of experience; 6 participants had less than 5 years of experience. Only 3 participants had 16 to 20 years of experience.

A large number (12), which constitutes 20% of the studied participants, had more than 20 years of involvement in the gardening means the farmers are unlikely to leave out the profession in short time. This durability is a great strength for organizations working to scale-up kitchen gardening. What is very concerning is the downward trend of engagement in gardening after 10 years.

The nature of involvement showed that kitchen gardening was done exclusively by single individual. It was found that more than four persons in every five, that is 83.3% of the participants, managed the garden themselves. Only in 11.7% household, two members were reported to work for kitchen gardening. This shows that kitchen gardening in Itahari so far is one-person enterprise.

Regarding the time spent in garden, three-fifth of the participants (60%) said they get involved for one hour every day. Another significant portion (31.7%) spent two hours per day. 3.3% involved three to four hours per day. A small proportion (1.7%) dedicated five hours per day for the garden (see **Figure 3** below).

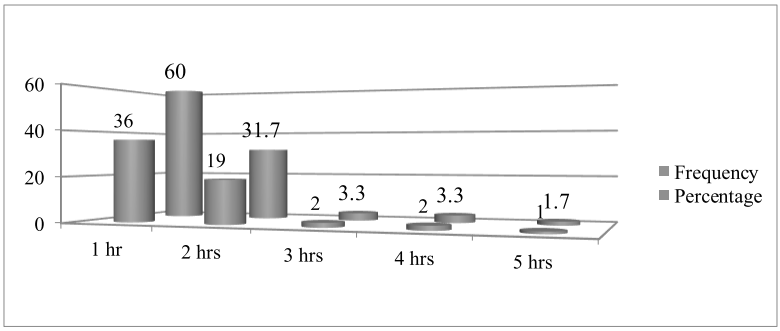

Figure 3: The time spent in garden

In response to question about the reason for gardening, where the participants were given to select as much as applicable reasons, majority of them (70%) said they did kitchen gardening for economic purpose. Nearly 52% did kitchen gardening for exercise. 30% for the waste management 26.7% as hobby and very few people (1.7%) did not present any specific reason (see **Figure 4** below).

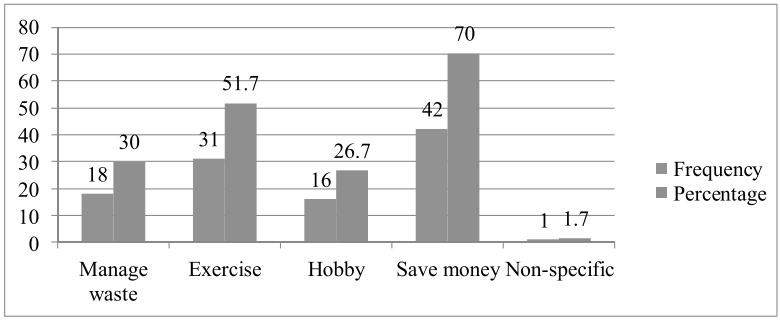

Figure 4: The participants' reasons of gardening

Regarding the type of land used for kitchen gardening too, the participants had options to select from as many as applicable in their case. Very significantly high number (91.7%) reported to do kitchen gardening in self owned land, 45% used nearby land, 5% used rooftop, and 1.7 % could not specify the type of land used by them.

Among the participants, the portion of gardeners who had run kitchen garden

before comprised only 21.7%, *i.e.*, 13. An overwhelming majority (78.3%), however, did not have such garden before. This suggests many gardeners did not have previous experience of running kitchen garden before they started in the present place.

In terms of variety of vegetables grown in kitchen garden, it was found that very large share of them (43.3%) grew three to four varieties of vegetables. 40 % cultivated five to six variety of vegetables, 11.7 % grew seven to eight type of vegetables. Only 5% grew one to two varieties of vegetable.

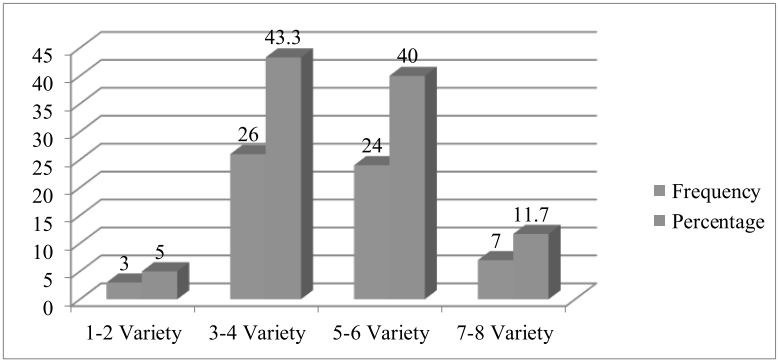

Figure 5: Variety of vegetables grown in kitchen garden

Economic aspect of kitchen gardening

Economic benefit of kitchen gardening was noted largely in terms of sustenance economy, whereby sustenance refers to means for everyday consumption.

It was found that nearly one-fourth vegetable need of more than half (55%) household was met by the products from their garden. That is to say, more than half the respondents engaged in kitchen gardening met their 25% need of vegetables from kitchen gardening. Another significant share, that is 38.3%, met the half demand of vegetables need from their garden. 5% met three-fourth demand of need of vegetable. Those who met cent percent need of vegetable from kitchen garden comprised only 1.7%.

The products from kitchen garden are not surplus in the participants' household. This means kitchen gardening, so far, has been understood as

means to meet some demands of the family. This finding was also reflected in response to the question, do you sell surplus product in the market. Most of the respondents (98.3%) reported that they did not sell the product; only one, that is (1.7%), said that some vegetables were sold. This shows that the products in kitchen garden are meant for self-consumption.

In response to the question related to expenditure during start-up and maintenance, 46 out of 60 participants (76.7%) said they invested between Rs 1001 to Rs 2000. Another significant number, 13 out of 60, which is slightly more than one-fourth (21.7%) reported to have used Rs. 2001 to Rs. 3000 (see fig. 11 below). Those who used over Rs. 3000 but below Rs. 4000 comprised only 1.7% of the respondents. This figure shows that kitchen gardening as micro-enterprise does not need great investment.

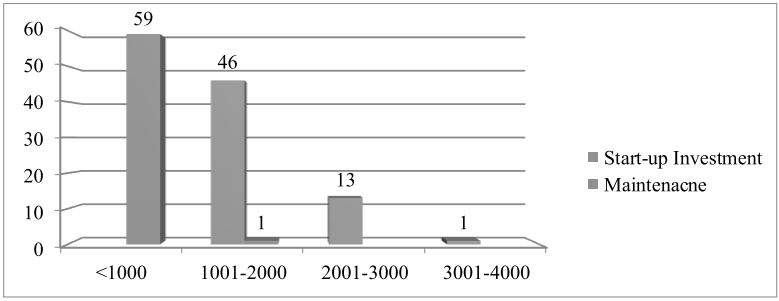

Figure 6: Startup and maintenance investment of kitchen garden

The figure above (see **Figure 6** above) also presents investment for maintenance of kitchen gardening. Almost all (98.3%) said, they used less than Rs. 1000 every year. Those who reported to have used Rs. 1000 to Rs. 2000 made up only 1.7% (one out of 60). This speaks that maintenance of kitchen gardening is not very costly.

Compared to investment, saving from the kitchen gardening was reported to be high. As shown in the figure below, nearly four-fifth of the participants (78.3%) said they saved Rs. 2000 to Rs. 4000 every season (each season comprised 3 months), and nearly one-fifth (17%) reported that they saved between Rs. 4001 to Rs. 6000. A small portion (1.7%) reported they earned below Rs 2000, and the same percentage reported Rs. 6000 to Rs. 8000 and above Rs. 8000.

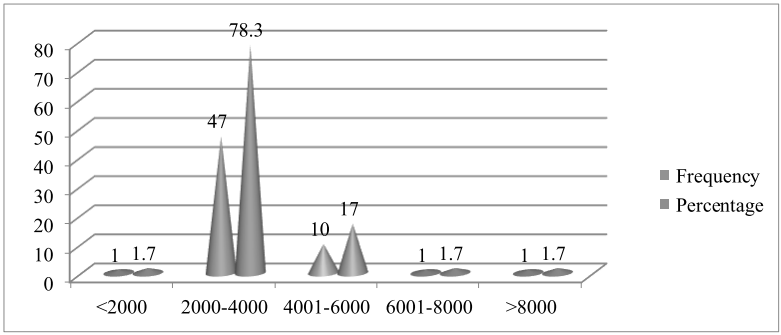

Figure 7: Saving from the kitchen gardening

The amount of saving suggested in the figure is indicative only, as it presents in range figure. To calculate the amount of saving alternatively, the participants were asked to write their expenditure before and after they started kitchen gardening.

Based on their response, an average expenditure of each family before they had kitchen garden was calculated. The figure amounted to Rs. 5953 per month. Similarly, the calculation of average expenditure of each family was calculated to be Rs. 2333. Calculating the economic contribution of each family, the surplus from kitchen gardening is Rs 3625 (derived from subtracting expenditure before and after kitchen gardening). This calculation, in the light of self-reported income from kitchen gardening (see **Figure 7** above), also shows similar finding.

To understand the cost and benefits of kitchen gardening, benefit cost ratio (BRC) was calculated. Though BCR is often used in corporate finance to detail the relationship between possible benefits and costs, its use is not confined to this particular domain only. Scholars have used BCR in other domains as well. Based on this extension, this study calculated BCR. The particular formula used in this study is, $BCR= B_t/ C_t$

Where B_t and C_t are the benefits and costs in certain time respectively.

The cost function in kitchen gardening was calculated using the formula,

Cost function (C_t) = variable cost + fixed cost

= (76.7x1500+23.3x2500)/100 + 1000

= Rs. 2733

The value of B_t as shown in the calculation above is Rs. 3625

Now, calculating the BCR,

$BCR = B_t / C_t$

= Rs. 3625/ Rs.2733

=1.31

The value of BCR > 1, which means, kitchen gardening as micro-economic venture is worthwhile. A major limitation in this calculation is the fact that time issue is calculated in short terms, thereby not foreseeing profitability. To understand this issue, a longitudinal study is recommended.

Future prospect of kitchen gardening

Almost all the respondents (96.7%) were found enthusiastic about the contribution of kitchen garden in improving food supply. Very similar response was given regarding the role of kitchen garden in improving variety of food in household consumption. 96.7% said they felt kitchen garden contributing to improve food variety at home (see **Figure 8** below).

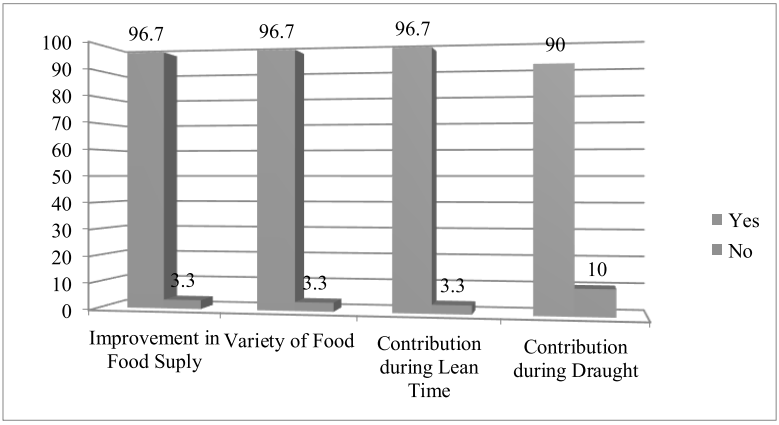

Figure 8: People's perception about kitchen gardening

The response of the participants regarding their willingness to continuing the

garden also showed optimistic result. Nearly all (95%) answered that they wanted to continue.

A major concern, as reported by the respondents, was related to their unfamiliarity with new skills. It was found that only 15% learnt skills required for kitchen gardening whereas majority (85%) did not learn any new skills even after working for years in the kitchen garden. The naivety of the gardeners about required skills even after working for years in the garden is a serious concern, especially for organizations working to improve kitchen gardening practice.

Conclusion and Recommendation

A number of conclusions have been drawn based on the results and discussions. First, agriculture in Itahari sub-metropolitan city is subsistence oriented and the number of people engaged in farming is in decline. Second, kitchen gardening has remained within the purview of certain categories of people. As an enterprise, it appears as women driven with very less participation of male. Particularly, married-women-aged-30-to-40-having-secondary-level-education are involved in gardening activity, which means the enterprise has been understood as easy to get and involve into after marriage. Very small number of young people below 30 years is involved in gardening. This leads to the conclusion that gardening activity among younger generation has yet not been practiced. Third, education level is found to have relation with involvement in kitchen gardening enterprise. Particularly, the participants with secondary level of education are more into this enterprise. This appears in contrast with general understanding: uneducated people are involved in easy home-bound works. Fourth, people are involved in kitchen gardening irrespective of the source of family income. More people having business as their source of income are engaged in farming indicates that kitchen gardening is no longer the enterprise of people with farming as major source of income. Fifth, kitchen gardening as enterprise is managed largely by a particular individual in the family. The report of participants about very minimal support from other members drives to the conclusion that kitchen gardening has yet not received status of enterprise in families. Sixth, since kitchen gardening is being done within self-owned space, specifically adjacent to house land, there is potential to extend the scope of land use for gardening. Roof of the houses, which are

very minimally used, can be utilized for increasing production, diversification of crops and economic benefits. Seventh, very limited types of crops are grown up in kitchen gardening speaks to the fact that there are potentials to increase varieties and thereby make maximum use of vegetables for household use. This will contribute to economic surplus of individual families. Eighth, there are commitments of the participants to continue this enterprise. Individuals working in kitchen garden have a long history of engagement in this work helps to conclude that people love to work in the garden. This carries a great significance in a context when unemployment is growing high. Kitchen gardening can be a part time job. Ninth, the duration of engagement in this enterprise is very low, kitchen gardening as full time venture cannot be thought of yet. This finding leads to the conclusion that people have not recognized broader potential of kitchen gardening. This, however, does not mean that the farmers are not aware of economic benefits of their activities; what they lack in their understanding is greater economic potential of kitchen gardening. Tenth, the fact that many of the gardeners are not familiar with skills required for this work means that the work is going on with no positive interventions. Eleventh, kitchen gardening is supplying with very small portion of household need of vegetables. This means that there are spaces for intensifying production as household need alone would consume three times production from gardening. Twelfth, the gardening appears as low-investment high-benefit enterprise, which is a great strength and can be used as motivational factor for larger number of people's engagement. Thirteenth, gardening as enterprise does not involve many challenges; this is another greater strength of the business. The existing challenges can be mitigated with very minimal efforts and investment. Fourteenth, the participants' awareness of kitchen gardening as economic activity open up space to consider that this venture can be one of the major sources of income generation and thereby a contributor in economic growth.

Kitchen gardening so far has been confined to sustenance. Of, course the need of households are met to varying degrees by the products from kitchen garden. But, commercialization has yet not started. This means, this entrepreneurship still exists as unacknowledged economic activity. It demands that scholars working in this domain work in collaboration with other line agencies to establish the activity as economic venture. An interrelated issue concerns investment and return. Despite the fact that the

people do not need to invest huge amount and the return is high, this enterprise has potential to be advantageous to families. The significance of this study lies in the fact that it is the first of its kind. As it explores the concern which has yet not been acknowledged, the finding can have significance in a number of areas. At a local level, the finding may contribute in people's decision for/against kitchen gardening. The finding can also have policy level implication in a context when cultivable lands are shrinking due to rapid urbanization.

There are three major categories for limitation of this research: financial, spatial and temporal. The financial limitation is the lack of funding and researcher's financial constraints. The spatial limitation of this research is that the study will be carried out in only two wards of Itahari municipality. Temporal limitation is that the study bases on the interviews conducted during December and January, only. Because this study is small scale, it has the following limitation:

i. The finding of this study can be indicative of rapidly urbanizing places, and thus its conclusion and generalization may or may not be applicable in the other part of the nation.

ii. The study uses simple statistical tools such as bar diagram, chart, percentage etc. Hence, they do not address many complex concerns.

Based on the findings of the study, the following recommendations are made.

i. Agencies working in kitchen gardening should consider about the engagement of diverse group of people in terms of age, gender, and marital status. Middle-aged-married-women as the sole caretakers of kitchen gardening needs to be taken into account while implementing any action plan about kitchen gardening.

ii. Since comparatively higher number of better educated people are involved in kitchen gardening, line authorities working to boost kitchen gardening need to reconsider their understanding about the people involved, and thereby formulate strategies targeting these people.

iii. There is enthusiasm and dedication of the farmers in kitchen gardening. But, as the profession cannot provide them with full-time

engagement, the concerned authorizes paying attention to loner time involvement would make such farming more beneficial economically. This in the long run can contribute in the GDP.

iv. The entrepreneurs' ignorance about diverse forms of kitchen gardening demands attention of the concerned authorities. Awareness about diversity would certainly contribute to increased production.

v. For other further researches, the research provides some loose ends where other researches can be carried out.

vi. For policy makers, the finding helps to policy maker to promote kitchen garden to every houses in urban areas for fresh vegetables, make best use of land and physical exercise.

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