

Improving Socio-economic and Environmental Benefits of Households Practicing Urban Farming in Coimbatore

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ABSTRACT: The present investigation was carried out to study the impact of urban farming in the socio economic behaviour of households at Coimbatore district of Tamil Nadu during 2012-13. Urban farming or urban gardening improved socio-economic conditions of the households who practiced urban gardening. The economic conditions were improved by reducing food expenditure and smaller increase in income in case of few households. However, safety and healthy food production from own house was a major benefit for household being a self-sufficient. Moreover, urban gardening increased the food diversity and thereby has chance of reducing the malnutrition which is prevalent in Indian community. Social benefits of urban farming included more interaction with neighbours, improved social status and social network and relieved stress from monotonous office work. The environmental benefits of urban farming include effective utilization of household food waste and biodegradable garbage by composting. Few extents, effective utilization of household waste water for vegetable production. Other benefits are reduction in air pollution and heat, cooling effect of house due to roof top gardening and thereby reducing the use of electricity for air conditioning. Overall urban farming has potential to improve the environmental conditions of city.

Keywords: Urban horticulture, livelihood, food security.

INTRODUCTION

Global population would be around 9 billion by 2050 which has tremendous pressure on agricultural land for meeting the food demand of ever-growing population. On one hand, malnutrition or under nutrition is a major problem, around 231 million people (around 21%) are undernourished in India and 40% malnutrition children in the world are Indians (FAO, 2008). On the other hand, over nutrition or obesity has been rising for the past one decade due to over intake, unhealthy diet, eating only few kinds of food, and reduction in intake of vegetables and fruits. Urbanization and industrialization is add to the issues and is likely to eat up the productive land and pushing food production lower than expected. It is estimated that less than 40% of the global population lived in a city in 1990s but as of 2010, more than 50 percent of people live in an urban area (FAO, 2012). It is forecasted that by 2030, 60 percent of total population will live in a city, and by 2050, this proportion will increase to 70 percent. In India more

than 30% of the people live in urban areas (Anonymous, 2003).

Urban agriculture is the practice of cultivating, processing, and distributing food in or around a town or city. Urban agriculture contributes to food security and food safety in two ways: first, it increases the amount of food available to people living in cities, and second, it allows fresh vegetables and fruits to be made available to urban consumers. The types of urban agriculture are kitchen gardening, terrace (rooftop) gardening, attaching the pots and plants in the walls, and community gardening in school, municipalities, government offices and corporate offices. Urban agriculture widely practiced in Mumbai, Delhi, Hyderabad and Bengaluru and recently in Pune. In Tamil Nadu the urban farming is practiced in cities such as Chennai and Coimbatore to some extent. Urban farming contributes positively to the provision of fresh food (horticulture, fruit, eggs, milk, etc.) for the urban dwellers. However, this contribution varies from city to city. Urban agriculture

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is attributed a potentially beneficial role in terms of the urban economy, urban food supply and urban development in general (Smitet *al.* 1996). Although largely an informal economic activity, urban farming provides employment as well as an income for those involved. This income can be directly realised through the sale of crops or indirectly as a result of the need to purchase less food.

The major environmental benefit of the urban farming is the reduction of the food miles. The economic benefit is the reduction in the expenditure of food and resilient to the price fluctuations. Other major benefits of urban agriculture are food security, increases the availability and accessibility of food, additional income, fresh food, damage of products reduced, aesthetic beauty, reduces heat effect & temperature, use of waste water & management of the stability of soil. However, little research has been carried out to capture these benefits at urban dwellers and therefore, this study aimed to investigate the socio-economic and environmental benefits of households practicing urban farming in Coimbatore.

MATERIALS AND METHODS

Study Area

Coimbatore is a metropolitan city in India was selected for this study to investigate the effect of urban farming on socioeconomic condition of urban farmers and environmental issues of the city. The city was chosen due to growth of urban farming for the past one decade and interest of city corporation city waste utilization for producing energy and compost. The mean maximum and minimum temperature varies between 35 °C (95 °F) and 18 °C (64 °F). The average annual rainfall is around 700 mm. The soil is predominantly black, which is suitable for cotton cultivation, but some red loamy soil is also found.

Sampling Methods

This study used snowball sampling method which is a non-probability sampling technique where existing study subjects recruit future subjects from among their acquaintances. Thus the sample group appears to grow like a rolling snowball. In snowball sampling, the researcher recruits a few eligible individuals who are then asked to bring in other potential respondents or provide references (contact details) for other potential respondents. These persons are then recruited and are also asked to bring

in or provide references for other potential respondents and so on. Snowball Sampling is a method a used to obtain research and knowledge, from extended associations, through previous acquaintances. Snowball sampling is a useful tool for building networks and increasing the number of participants. There are many reasons why an individual may want to use snowball sampling across any industry, research, job, etc. Snowball sampling locates hidden populations and specific population though it may be non-random.

Data Collection and Analysis

Semi-structured face to face interviews were used as the major method of information gathering from 30 city gardeners. Semi-structured questionnaires were used to collect information on socio-economic and environmental benefits of urban farming. This interview technique allows the collection of both quantitative and qualitative in-depth information and supports open-minded, participatory research. A set of open-ended questions not predetermined as an interview guide is used in semi structured questionnaires (Casley and Kumar 1988). Based on this guide, the researcher asks questions which are as broad as possible. This allows the respondents to direct the flow of the conversation and communicate their own ideas rather than being directed by predetermined answers. This provides enough flexibility to discuss aspects that may not have been considered by the researcher but which are important to the respondent. Hence, questions on benefits of urban farming were collected as open ended questions.

The interviews were held in the urban gardener's house. This provided the opportunity to gather additional information by observation, for example about the condition of the urban farms, cultivation techniques, the condition of crops, and the appearance of the households. Each interview lasted approximately one hour and all the questions were asked at the same interview. Questionnaires were translated into local language-Tamil for data collection. 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. Data were analysed using SPSS, 2008. Sample comparison was conducted using independent t-tests for household characteristics. Differences with P-value less than 0.05 were considered statistically significant.

RESULTS

Demographic Characteristics

The general demographic characteristics of urban farmers of Coimbatore city are presented in Table 1. Demographic characteristics were differing among the urban farmers. The average ages of urban farmers are 50 years old though it ranges from 30 to 72 years. Average family size was found to be 4 and ranges from 2 to 10. Most of urban farming practiced since as an average 8 years though majority of them settled for the past 18 years. The average size of the urban garden is 852 square feet and most of them were working for 8 hours in a week.

All of the urban farmers are educated except one urban farmer and more than 50 percent of them have university degree, higher proportion had undergraduate degree. Around 60 percent of urban farmers are male farmers and 80 percent of the urban farmers practiced in own house. Only 10 percent of the urban farmers received training for their home gardening and 90 percent of the urban farmers did not get formal training (Table 2). Most of the surveyed urban farms cultivate vegetables in the open space (66%) near the house while 23 percent cultivate in the rooftop. Only 10 percent of the urban farmers cultivate both in rooftop and in the open space near the house. Majority of the urban farms used soil (80%) as a growing medium for cultivating the crops and only 10 percent of them used a cocopeat for growing crops.

Urban Farming and Environmental Issues

The few statements about effect of urban farming or home gardening on environmental issues are listed in Table 3. The household waste effectively utilized for composting in 83 percent of the household whereas only 13 percent of the household had concern of heavy metal accumulation in their home grown food. Remaining 87 percent of the household not concern or not aware of the heavy metal accumulation. They are positively answered for reduction in use of air conditioning because of rooftop gardening, around 60 percent of the household answered yes while 27 percent answered no though around 13 percent of the household not noticed any change.

The practice of urban farming on reducing environmental problem is presented in Table 4. The household members asked to rank based on their experience or perception. Fifty percent of the urban farmers ranked as first that urban gardening reducing the air pollution. They felt that urban gardening helps

in effective use of household waste food followed by effective use of household waste water. Urban gardening helps in disposing garbage was mentioned as fourth rank.

Urban Farming and Economic Conditions

The surveyed urban farmers experienced that household food expenditure (especially on purchase of vegetables) were reduced by adopting urban gardening or home gardening (Fig 1). Around 30 percent of the household were experienced 20-40 percent reduction in food expenditure, 25 percent of the household felt 10-20 percent reduction in food expenditure (Fig 2). Interestingly, around 5 percent of the household stated that completely reduced purchase of vegetables for their home due to home gardening. Around 12 and 5 percent of the household were able to reduce the food expenditure by 40-60 and 60-80 percent, respectively. There was no response from around 13 percent of urban farmers on the question about the income improvement through urban farming though 87 percent of urban farmers responded (Fig. 3).

Urban Farming and Social Issues

The statements regarding the effect of urban farming on few social issues are presented in table 5. All of the surveyed urban farmers agreed that urban gardening reduced stress and improved access to safer and healthier food. Around 87 percent of the urban farmers agreed that their relationship with neighbour was improved due to urban gardening. Also, urban gardening improved social status for 67 percent of the surveyed urban farmers though 20 percent of the urban farmers were not able to measure this variable. Interestingly, 83 percent of surveyed urban farmers felt that their social network were increased and 93 percent of the surveyed urban farmers were happy about their improved knowledge on food nutrition due to adoption of urban farming or terrace gardening. Moreover, the diversity of the food in the plate were increased among 87 percent of the surveyed households due to the own vegetable and fruits production by adopting urban gardening. Overall, urban gardening or urban farming increased the knowledge on food nutrition and improved their social networks and relationship with neighbours.

DISCUSSION

The people living for many years in the city especially on own house, are tend to practice urban gardening than recently settled in rented house. Owners of the

Table 1
Demographic Characteristics of Urban Gardeners in Coimbatore City

S.No	Variables	Mean	Minimum	Maximum	Standard deviation
1	Age (years)	50	30	72	11.28
2	Family size (numbers)	4.13	2	10	1.5
3	Experience (years)	8.43	0.2	50	12.6
4	Size of the garden (Sq. ft.)	852	108	2000	477
5	Existence (years)	18	4	50	12.7
6	Working hours (per week)	8.27	1	36	6.6

Table 2
Training and other Related Issues of Urban Gardeners

S.No	Statements	Numbers	Percent
1	Number of persons received training for starting urban gardening	3	10
2	Place of garden		
	a. Home garden in the ground	20	66.7
	b. Garden in the rooftop	7	23.3
	c. Both in rooftop and ground	3	10.0
3.	Medium used for growing vegetables		
	a. Soil	24	80.0
	b. Cocopeat	3	10.0
	c. Both soil and cocopeat	1	3.30
	d. Others- own medium	2	6.70

Table 3
Environmental Impact of Urban farming

S. No.	Statements	Yes (%)	No (%)	Don't know or not sure (%)
1	Household waste used for composting	83	17	0
2	Concerns of heavy metal accumulation in home garden food	13	50	37
3	Reduction in use of Air conditioning due to rooftop gardening	60	27	13

Table 4
Advantages of Urban Farming on Reducing Environmental Problems

S.No	Variables	Number of respondent mentioned			Total score of each factor
		as first rank	as second rank	as third rank	
1	Household waste water effectively used for urban gardening	8	1	2	28 (3)
2	Household wasted food effectively used for urban gardening	5	8	1	32 (2)
3	Urban gardening reduce air pollution	15	5	5	60 (1)
4	Urban gardening effectively disposed garbage	1	7	7	24

Values in parentheses are rank

Table 5
Advantages of Urban Gardening on Social Issues

S.No	Statements	Yes (%)	No (%)	Don't know or not sure (%)
1	Urban gardening reduced stress	100	0	0
2	Urban gardening improved the relationship with neighbour	87	7	6
3	Urban gardening improved social status	67	13	20
4	Urban gardening improved social network	83	17	0
5	Urban gardening improved the knowledge of nutrition	93	7	0
6	Urban gardening improved the access to safer and healthy food	100	0	0
7	Urban gardening increased the diversity of food in the plate	87	10	3

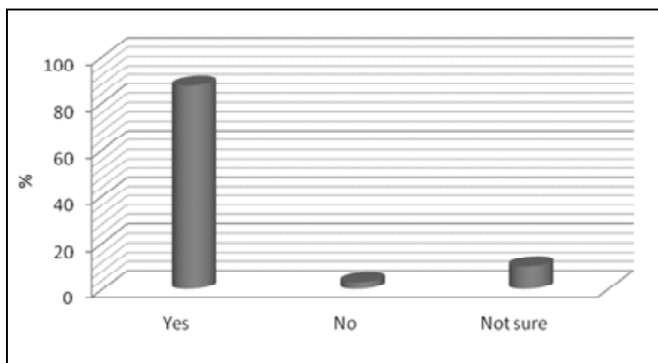


Figure 1: Reduction in Food Expenditure by Urban Gardening

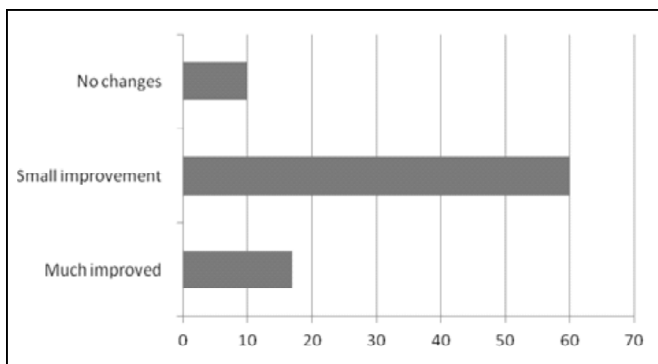


Figure 2: Income Improvement by Urban Farming (%)

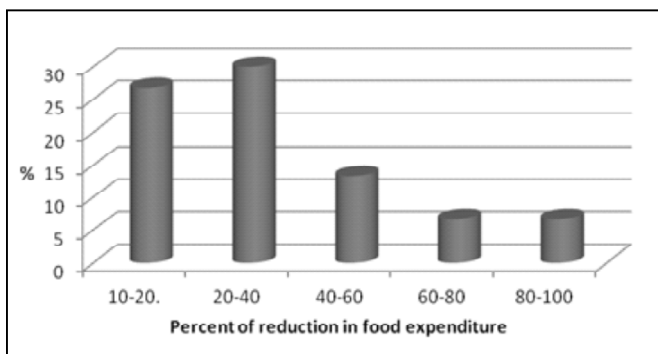


Figure 3: Reduction in Food Expenditure by Urban Farming

house do not allow rented people to do anything in India. Maximum urban gardeners are old people, retired from service, mainly doing it for hobby, happiness, or alternative to exercise. However, younger or middle age people are practicing urban gardening mainly for reducing food expenditure, or as a business, or for home consumption. There were studies reported that urban agriculture practiced mainly to improve food security, health and safety of urban household (Armar-Klemesu 2000; Sanyal 1987). Generally, highly educated people are practicing urban gardening which may be due to increased knowledge on importance of vegetable consumption, and environmental benefits of urban gardening. The

people who practice urban farming mainly for to relieve from the stress, enjoy the flavour of home grown food, happiness, safety and healthy food, though some aimed to reduced food expenditure due to skyrocketing of price of vegetables for the past 7 years. The one study stated that urban agriculture is seen as a clean strategy for urban poor to reduce their vulnerability to uncertain economic changes and market fluctuation of vegetables (Sanyal 1987) while other study found that urban agriculture improved economic welfare of households (Lado, 1990).

Most of the people are doing urban gardening on their own, without undergoing any professional training. They are practicing it because of their agricultural family background and interest on crop production even though they moved to city. Some private professionals provide training to interested city people on urban gardening though government sector not yet fully involved which may be due to difficulty in accessing interested urban households. Other studies also found that lack of training and experience were the major obstacle for expanding their small scale urban farms into large farms (Feenstra *et al.*, 1999; Kaufman and Bailkey, 2000).

Household wastes are effectively used for composting and compost is used as medium for nutrient supply for plant growth. Hence, urban gardening is a best tool for reducing the environmental problem of poor garbage disposal in the city. But, many of urban gardeners do not aware of heavy metal accumulation of city garbage which may be due to lack of proper professional training and knowledge on urban farming. Though urban agriculture transforms city waste water for irrigation & solid wastes, sewage sludge are composted and used as manure but absorption of heavy metals by plants may affect the consumer (WHO, 1992). However, many of urban gardeners are aware of environmental benefits of urban farming. They opinion that urban farming is good for reducing the air pollution, reducing biodegradable garbage by composting, increase the cooling effect of house by root top gardening and thereby reducing the use of electricity utilized for air conditioning.

Though reducing food expenditure is not a major aim of many urban farmers but more than 80 per cent of urban farmers experienced it especially for vegetable purchase. Some households completely avoided in purchasing the vegetables from the market and there by a self-sufficient in vegetable production. Most of the farmers reduced their food expenditure for about 40 to 60 per cent which may be utilized for

other livelihood expenditure. However, urban farming does not increase the income significantly. The above mentioned effects of reducing food expenditure and increasing the diversity are direct benefits of urban farming. However, indirect benefits are many such as on environment and social issues. Fodor (2011) argues that community centered food assets are successful ways to address issues of food security, while providing space for community engagement and cultural exploration through food. When localized, the farm, farmer, and consumer are all integrated into a perceivable and manageable social structure that facilitates trust (Hinrichs, 2000).

Generally, the people living in cities have less or no interaction with each other though they live as neighbour for so many years. But, urban farming are changing the situation by giving opportunity for neighbours and other people to interact with the urban gardeners due to their curiosity of knowing about the urban gardening and the benefits. Similarly, urban farmers share their excess vegetables produced from their home with neighbours. Thus, urban farming increased social life, social network and reduced stress because of interaction and more social activities. Urban farming also increased their diversity of food which may help in reducing the malnutrition of city people.

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