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Assessment of Food Security Among Urban Agriculture Practitioners of Hyderabad

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ABSTRACT

Urban agriculture is emerging as one of the most important and efficient way to ensure food and nutritional security of the urban population. The current study made an attempt to study the food security met out through urban agriculture practices by urban agriculture practitioners in Hyderabad city of Telangana. Assessment was done using semi-structured interview schedule and the data results were logically interpreted. Data of the results show that majority of the respondents grew their own fruits, meeting <25 per cent of their monthly requirement, vegetables to the extent of >50 per cent of the monthly requirement and negligible percentage of the respondents were into meat production and milk production, as part of urban agriculture activities. Dietary diversity of the respondents revealed that cent percent of them fell under acceptable level of food consumption score. Quantity of intake was not appreciable for almost all the food groups except for pulses and fats & oils as compared with the Recommended Daily Intake (RDI). Nutrients like energy, calcium, iron, vitamin A intake was also low as such, when compared with the Recommended Dietary Allowance (RDA). Overall food and nutritional security of the respondents is met out to a considerable extent, particularly for vegetables & fruits. Hence, there is a need to improve nutritional security of the respondents by popularizing the concept of urban agriculture among the urban and peri-urban dwellers and creating awareness through training programmes, campaigns etc. on the nutritional aspects.

Keywords: Food groups, Food security, Recommended daily intake (RDI), Recommended dietary allowance (RDA), Urban agriculture

INTRODUCTION

By the year 2030, more than 60 per cent of the world population will live in urban areas (Alexandratos and Bruinsma, 2012). The steady urban population growth will put an enormous pressure on sustainable planning and management of urban regions and their food security as mentioned by (Djordjevic *et al.,* 2011). It will lead to issues such as loss of greenfield, increase of energy usage associated with commuter traffic (Naphade *et al.,* 2011), reduction of fertile lands to deforestation, water pollution and the creation of peri-urban areas (Misra, 2011).

Apart from rural agriculture, the concept of 'Urban Agriculture' (UA) as a food security solution has emerged over the centuries, owing to the growing global population and to tackle increased urbanization (Game and Primus, 2015). By 2050, approximately 68 per cent of the world's population is expected to live in cities, hence agriculture will need to produce almost 50 per cent more food than in 2012 to feed the people of 9.73 billion around the world (FAO, 2017). Consequently, UA is increasingly being considered to be a major way for the future urban food security.

The contribution of urban agriculture is estimated at 100-200 million urban practitioners involved in ensuring food security worldwide, by producing and marketing fresh agricultural products (Orsini *et al.,* 2013). Rural communities with Nutri-garden had a positive impact on food security by providing micronutrient rich food and high dietary diversity substantially helps in reduction of micronutrient deficiencies (Jethi *et al.,* 2020). Majority of vegetables growers had never consulted the government and semi government institutions and their publications for acquiring information related to use of insecticides for cultivation of vegetable crop. This may be the reason that they were using non recommended practices of

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vegetable cultivation. So, there is need to create awareness among vegetable growers regarding authenticated sources of information in order to achieve the food security (Kaur *et al.,* 2012). With this background the present study was conducted to assess the extent of food security met out through urban agriculture practices by the urban practitioners in Hyderabad city.

MATERIALS AND METHODS

The present study focused on the assessment of food security met out through urban agriculture practices by active urban agriculture practitioners from the city of Hyderabad, Telangana. The survey was carried out during January to August, 2019. A total of 100 respondents who were actively engaged in urban agriculture practices were selected as the sample and the data were collected through the developed semi-structured interview schedule. Data on percentage of food security met out for different foods produced through urban agriculture, Food Consumption Scores (FCS), foods consumed by the respondents and their nutrient intake were collected from the respondents. The data was statistically analyzed using descriptive statistics i.e. mean, percentage and standard deviation (SD) and presented logically in detail under results and discussion section.

RESULTS AND DISCUSSION

This section discusses about food security met out through urban agriculture for the selected respondents, which includes information on percentage contribution of urban agriculture practices in meeting food security, food consumption pattern, percentage of different foods consumed, food consumption scores and intake of different food groups.

To ascertain percentage contribution of urban agriculture in meeting food security of the practicing respondents, the respondents were asked to indicate the quantity of different foods grown through urban agriculture and the quantity purchased from markets on a monthly basis. Accordingly, percentage was calculated and the percentages were categorized as <25 per cent, 25-50 per cent and >50 per cent for the seven food groups as presented in Table 1.

Percentage of food security through urban agriculture was highest for vegetables (81%) with >50 per cent of the requirement of different vegetables being met out from their own farm, whereas for 12 per cent of the respondents, vegetables requirement was met out to the extent of 25-50 per cent and for the remaining 7 per cent of the respondents, vegetables requirement was met out to the extent of <25 per cent from their own gardens. It was noticed that for majority of the respondents (85%), fruit requirement, calculated on a monthly basis, was met out only to the extent of <25 per cent through urban agriculture/own kitchen garden, followed by 10 per cent of the respondents who could meet >50 per cent of the fruits requirement from their own gardens, while another 5 per cent of them could meet upto 25 to 50 percent of the fruits' requirement that were grown by them at home.

Table 1: Percentage food security of different foods met out through urban agriculture

Food groups	Percentage contribution from urban agriculture			Total
	<25%	25-50%	>50%	
Vegetables	7	12	81	100
Fruits	85	5	10	100
Milk and milk products	-	1	-	1
Meat and meat products	-	-	1	1
Egg and poultry	-	-	-	0
Fish and other sea foods	-	-	-	0
Mushroom	-	-	-	0

From the above results, it is evident that majority of the respondents were able to grow their own fruits only to the extent of <25 per cent of the monthly requirement, vegetables >50 per cent of the monthly requirement and the least for meat and meat products (>50%) and milk and milk products (25-50%). The reason for the majority of the respondents to meet adequate requirement of fruits and vegetables through urban agriculture practices could be because of the easy availability of the seeds, narrow rooting system, easy maintenance, low space utilization with high productivity and short duration of the yield. It implies that the urban agriculture practitioners are able to address food as well as nutritional security through sufficient supply of fresh vegetables and fruits and thus also meeting the micronutrient requirement of vitamins and minerals, which is essential for the optimum health and well-being. However, there is also a need to encourage urbanites regarding livestock/dairying practices, fish cultivation, mushroom, aquaponics etc. to meet the requirement of macro nutrients such as protein, energy and fat. This will enrich their daily diet and also bring dietary diversity to the family's meal.

Table 2: Classification of the respondents based on Food Consumption Score (FCS)

FCS	Profiles	Frequency (n=100)	Percentage
0-21	Poor	0	0
21.5-35	Borderline	0	0
>35	Acceptable	100	100
	Total	**100**	**100**

Data regarding food consumption score was categorized into 3 categories i.e. poor, borderline and acceptable using FAO, 2011 FCS method. Seven days food consumption history of the respondents was recorded and decoded under different food groups, classified and presented in Table 2. From the results it can be noticed that cent per cent of the respondents (100%) fell under acceptable level of food consumption score for Individual Dietary Diversity (IDD) index. This implies that there was good diversity in the food basket of the respondents. This could be partly due to the availability of fruits and vegetables from their own home garden or due to the better purchasing capacity of the respondents or due to easy availability of diverse food, by being in cities and town.

It may however be noted that the food consumption scores are only qualitative assessment but not the quantitative. For example in Indian cooking, addition of spices and condiments is quiet common but their quantities are very less. Similarly, coriander leaves and curry leaves are used just for garnishing purpose in food preparation, which also will be recorded as green leafy vegetable consumption, but if we look into the quantities of these foods, it will be very less which adds negligible quantity of nutrients into the diet.

Table 3: Food groups included in the diet by the respondents (daily)

Food Groups	Frequency	Percentage
Cereals	100	100
Pulses and Legumes	91	91
Roots and Tubers	64	64
Green leafy vegetables	91	91
Other vegetables	96	96
Vitamin A rich fruits	72	72
Other fruits	96	96
Milk and milk products	94	94
Eggs	37	37
Fish	3	3
Meat and meat products	2	2

A detailed study about the intake of food per day was carried under different food group's category as indicated in Table 3. It can be seen from the results of this table that cereals intake was cent percent by the respondents followed by other vegetables (96%), other fruits (96%), milk and milk products (94%), pulses & legumes (91%), green leafy vegetables (91%), vitamin A rich fruits (72%), roots and tubers (64%), eggs (37%), fish (3%) and meat and meat products (2%).

The result on food consumption data reveals that cereals like rice, maize and other millets (ragi, jowar, foxtail etc.) are the staple food for the people of Telangana State and is consumed every day. It is followed by other vegetables as there is daily intake of curries along with cereal based meal. Most of the respondents can afford to have fruits which may be the reason for its consumption, milk & milk products was included on a daily basis either in the form of milk, curd, butter milk or tea/coffee. Pulses and legumes also formed an important part of their daily diet in the form of dal/sambar/chutneys which is included as breakfast meals, wherein a combination of cereals and pulses is used, e.g. idly, dosa, uttappam etc. Consumption of green leafy vegetables (GLVs) was also noticed to be high because curry leaves and coriander leaves are added to most of the recipes. A few other GLVs like spinach, gongura, amaranth etc. were also commonly consumed. Vitamin A rich fruits like papaya, mango etc. was less consumed as compared to other fruits and vegetables. Roots and tubers like carrots, potato and beet roots were also consumed by more than half of the respondents (64.0%) on a daily basis. Eggs, fish, meat and meat products were consumed by less percentage of the respondents, which is a major concern as they are good source of high quality protein, vitamin A, calcium etc.

The average intake of different food groups by the respondents was compared against the Recommended Daily Intake (RDI), NIN 2017 and is presented in Table 4. From the data of the above table, it is evident that the percentage adequacy of different food groups of the respondents was more than the recommended percentage for fats and oils (155.0%) and at par for pulses (101.66%). The least percentage adequacy was observed in vegetables A category (4.0%) followed by milk and milk products (17.33%) and meat and meat products (19.0%). The

Table 4: Food groups consumed by the respondents

Food Groups	Respondents Intake (g) (Average)	Percentage Adequacy	RDI* (g)
Cereals	210	77.77	270
Pulses	61	101.66	60
Vegetable-A	4	4.0	100
Vegetable-B	93	46.5	200
Fruits	93	93.0	100
Milk and milk products	52	17.33	300
Meat and meat products	19	19.0	100
Fats and oils	31	155.0	20
Sugars	13	65.0	20

*RDI= Recommended Daily Intake

percentage adequacy for cereals was still below the recommended intake (77.77%) in addition to other food groups like sugar (65.0%) and vegetables B category (46.5%). The daily intake of fruits was appreciable (93.0%).

Although result on food consumption score of Table 2 revealed acceptable level of food consumption score for cent percent of the respondents, yet the quantity of intake was not appreciable for most of the food groups except for pulses and fats and oils, the intake was low for the respondents as compared with the RDI.

The daily intake of different foods by the respondents was converted into nutrient intake and calculated as percentage. This nutrient intake of the respondents was compared with the Recommended Daily Intake (RDI) of the NIN and presented in Table 5. It was noticed that except for fat (110±65) and vitamin C (120±135), no other nutrients intake e.g. carbohydrate, energy, protein, calcium, iron and vitamin A was adequate. This is because of the fact that the food quantity intake as highlighted in Table 4 is not adequate and so is the nutritional adequacy.

Nutrients like energy, calcium, iron, vitamin A intake was low as compared to the RDA. So, if we compare and interpret the findings in Table 3 and Table 4, it can be concluded that although the dietary diversity of the respondents as indicated in Table 3 is fairly good for most of the food groups, but the results of Table 4, that reflects quantitative intake of different food groups, is not appreciable for most of the food groups. Hence it suggests that the overall food and nutritional security of the respondents is not adequate. Moreover, there is an excessive intake of vitamin C, the excess and unutilized vitamin C will be excreted from the body, but the high intake of fat is harmful, as it gets deposited in the body and causes various cardio-vascular diseases, obesity and related diseases.

The results suggest that though the contribution of urban agriculture practices is obvious in meeting food and nutritional security of the urban farming practitioners, particularly vegetables and fruits, yet they are nutritionally not adequate. This is due to inadequate intake of different foods.

CONCLUSION

The results of the study showed that urban agriculture practices have supplemented the food requirement of the respondents to a considerable extent, particularly for vegetables and fruits. This has a direct impact on the food and nutritional security of the urban practitioners. At the same time, it is also to be noted that urban faming is generally limited to urban horticulture, rather than being adopted for apiary, dairying, poultry, aquaculture etc. Here lies the untapped potential and scope of urban agriculture in the coming years. Also there is a need to promote such practices more and more in urban and peri-urban areas to address food & nutritional security of the urban dwellers. Government should organize training programs to create awareness among the urbanites for popularization of the practice. In the current times of COVID-19 pandemic, the food and nutritional security of the people in peri-urban areas was at stake. During this difficult time, many people were attracted towards home grown foods. Hence there is a lot of scope and need for UA in developing countries.

Table 5: Nutrient intake by the respondents

	Carbohydrate (g)	Energy (Kcal)	Protein (g)	Fat (g)	Calcium (mg)	Iron (mg)	Vitamin A* (mg)	Vitamin C (mg)
Respondents' Consumption	227±52	1296±320	46±16	22±13	356±159	10±3	818±1059	48±54
RDI	270	1900	55	20	600	21	4800	40
Adequacy (%)	84±19	68±17	84±29	110±65	59±27	48±14	17±22	120±135

*Calculated in the form of Beta-carotene

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