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# Food and Nutritional Security in Khammam District through Urban Agriculture

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**Abstract:** ***Urban Agriculture is the practice of cultivating, processing and distributing food in or around a village; town or city. It also involves animal Husbandry, Aquaculture, agro forestry and Horticulture. The process of urbanization is fast spreading across different countries and regions to which India is no exception. Migration to urban areas is increasing to access the facilities and improved level of living. The World Bank (2000) estimates that approximately 50% of the poor live in urban areas. Low income urban dwellers spend between 40% to 60% of their income on food each year. It is very important or appropriate to promote urban agriculture in the present context as agriculture in rural India is facing challenges like fragmented holdings, depletion of soil nutrients exploitation of ground water, declining trend of food production and least preference for agriculture as an option of livelihood by farmers due to less profitability and high uncertainty, non availability of agricultural labourers in rural areas etc. The present study estimates the profile of urban population, the pattern of purchase and consumption and level of satisfaction with three major commodities like fruits, vegetables and milk. The study highlights the need to promote urban agriculture as a development strategy.***

**Keywords:** Food and Nutritional Security, Urban Agriculture and Khammam District

## 1. Introduction

According to FAO urban Agriculture means "An industry that produces, process, and markets food and fuel largely in response to the daily demand of consumers within town, city or metropolis on land and water dispersed throughout the urban and peri urban area, applying intensive production methods, reusing natural resources and urban waste to yield a diversity of crops and live stock."

The process of urbanization is fast spreading across different countries and regions to which India is no exception. The rapid urbanization resulting many implications i.e. urban poverty, food and nutritional insecurity, formal and informal employment generation and disposal of urban wastage and poor maintenance of air and river qualities (G.R.Desai etal. 2010)

In urban settings, lack of income translates more directly into lack of food than in rural settings. The costs of supplying and distributing food from rural areas to the urban areas or to import food for the cities are rising continuously, and it is expected that urban food insecurity will increase (Argenti2000)

Urban Agriculture may improves both food intake (cheap source of proteins) and quality of food, due to the removal of subsidies and price controls, spurring poor urban consumers to get access to food outside of market channels through home production or battering(Nugent, R.A. 2000).

Urban Agriculture to a large extent complements rural agriculture and increases the effiency of the national food system in that it provides products that rural agriculture cannot supply easily (e.g. perishable products, products that require rapid delivery open harvest), that can substitute for food imports and can release rural lands for export production of commodities ( De Zeeuw 2004).

Besides the economic benefits for the urban agricultural producers, urban agriculture stimulates the development of related micro-enterprises i.e. The production of necessary agricultural in outs and the processing, packaging and marketing of outputs. The activities or services rendered by these enterprises may owe their existence in part or wholly to urban agriculture (Butler 2002).

Urban agriculture may function as an important strategy for poverty allevation and social integration and also it can play an important role in the urban environmental management system. It is very important or appropriate to promote urban agriculture in the present context as agriculture in rural India is facing challenges like fragmented holdings, depletion of soil nutrients exploitation of ground water, declining trend of food production and least preference for agriculture as an option of livelihood by farmers due to less profitability and high uncertainty, non availability of agricultural labourers in rural areas etc (G.R.Desai etal. 2010).

Certain activities relating to urban agriculture have been practiced, though not on scientific lines, in the areas of Horticulture, Dairying, Back yard poultry etc. to meet personal needs or as a livelihood vocation. However, Khammam district is endowed with agro climatic and soil conditions in which a wide range of horticulture crops like mango, Banana, cashew, coconut, oilpalm, cocoa, pepper, vegetables etc. are grown. Production and distribution of various kinds of fruits, vegetables and flowers and their seeds are the major activities practiced by the farmers (G.R.Desai etal. 2010).

Khammam district had a population of 2,565,412 of which 19.8% were urban Population as of 2001 censes. Hence

introduction of urban agriculture, documentation of these activities and assessing the per caption of various stake holders in urban agriculture are very limited. In this context the present study is planned by the following objectives

1. To study the socio-economic status of urban population
2. To assess the perception pattern towards cost, of food commodities
3. To assess the expenditure pattern of the towards food commodities of urban population
4. To assess the consumption pattern of the of food commodities of urban population
5. To assess the attaining places of food commodities
6. To assess the satisfaction levels of urban population
7. To assess the Readiness towards urban agriculture

## 2. Methodology

The study was conducted in Khammam city of Telangana state. Stratified random sampling method was used to identify the sample. The data was collected using pre-tested questionnaire, sample of 80 members selected for this study. Simple percentage analysis was used for analysis of data.

## 3. Results

The results of the study was presented below

**Table 1:** Distribution of respondents based on profile characteristics of respondents (N =80)

| *Category* | *No. of respondents* | *Percentage* |
|---|---|---|
| **Age** | | |
| Young | 28 | 35.0 |
| Middle | 37 | 46.25 |
| Old | 15 | 18.75 |
| **Educational status** | | |
| Primary | 15 | 18.75 |
| Secondary | 35 | 43.75 |
| Collegiate | 20 | 25.00 |
| Illiterate | 10 | 12.50 |
| **Occupational status** | | |
| Govt. employee | 20 | 25.00 |
| Private employee | 25 | 31.25 |
| Self employment | 15 | 18.75 |
| Retired employee | 10 | 12.5 |
| House wife | 10 | 12.5 |
| **Family size** | | |
| Up to 2 members | 58 | 72.5 |
| 3 to 4 members | 20 | 25.0 |
| Above 5 members | 2 | 2.5 |

From the Table1 we noticed that 46.25 per cent of respondents were middle age, followed by 35.00 per cent in young and 18.75 percent of the respondents were in the category of old age. Over all it could be observed that around 81 per cent were in middle to young age group.

**Table 2:** Perception of urban population about cost of fruits, vegetables and Milk (N=80)

| *Age group* | *perception* | *No.* | *Percentage* |
|---|---|---|---|
| **Young** | | | |
| | Increasing | 26 | 32.5 |
| | Decreasing | Nil | -- |
| | Not aware | 2 | 2.5 |
| **Middle** | | | |
| | Increasing | 33 | |
| | Decreasing | 1 | |
| | Not aware | 1 | |
| **Old** | | | |
| | Increasing | 14 | 17.5 |
| | Decreasing | Nil | -- |
| | Not aware | 1 | 1.25 |

From the table2 we noticed that majority (43.75%) of the respondents studied up to secondary school level and only a minor member of respondents (12.50%) were illiterates, hence introduction of urban agriculture through training and literature can helps to promote this.

Regarding occupational status it was found that a majority (31.25 %) was private employees and 25 per cent were govt. employees and 18.75 per cent were self employed where as 12.5 per cent were retired employees and house wives respectively. Since majority of the population are private employees, and govt. employees depending on salaried income, fluctuations of prices of the food commodities affect their consumption pattern as well as for retired employees and house wives. Hence it is desirable to introduce urban agriculture as a part time activity. It can be observed from table1 that 72.5 per cent of the respondents have a family size up to 2 members fallowed by 25.00 per cent of the having up to 3 to 4 members and 2.5 per cent had five and above.

**Perception about cost of Fruits, Vegetables and Milk:**

It can be observed from (Table 2) that a great majority (19.5 per cent) of the respondents opined that cost of fruits and vegetables and Milk in the recent times increasing and they find it difficult to afford by irrespective of age groups. And 2.5 per cent young respondents not aware of cost increases followed by middle and old age people (1.25%) they may be considered as a negligible. Over all the respondents expressed that steed rise in price of fruits and vegetables and milk in the present day forced them to reduce the consumption pattern of these commodities and would affect their nutritional status and health status in the long run.

**Monthly expenditure towards Fruits, Vegetables and Milk**:

Monthly expenditure of urban population in Khammam towards purchase of Fruits, Vegetables and Milk

**Table 3:** Monthly Expenditure towards fruits, Vegetables and Milk (N=80)

| *Money spent in a Month* | *Fruits* | | *Vegetables* | | *Milk* | |
|---|---|---|---|---|---|---|
| | No | % | No | % | No | % |
| Upto Rs.500 | 19 | 23.75 | 16 | 20 | 10 | 12.5 |
| Rs.501-1000 | 32 | 40 | 45 | 56.25 | 48 | 60 |
| Rs.1001-1500 | 22 | 27.5 | 8 | 10 | 15 | 18.75 |
| Rs.1501-2000 | 5 | 6.25 | 6 | 7.5 | 5 | 6.25 |
| Above Rs.2000 | 2 | 2.5 | 5 | 6.25 | 2 | 2.5 |
| Total | 80 | 100 | 80 | 100 | 80 | 100 |

It is evident from the above Table 3 that 2.75 per cent respondents Spent up to Rs.500 per month towards Fruits, 20 percent towards vegetables, 12.5 percent towards Milk.

And 40 per cent respondents spent up to Rs.1000 towards Fruits, 56.25 per cent towards vegetables, 60 percent on Milk. The rest of the members Spent more than Rs.1000 per month. The data reveals that a Large population spending between Rs.500-1500 per month towards Fruits, Vegetables and Milk. Considering large urban centers like Khammam these figures highlight tremendous expenditure being incurred by family per month. This will indicates if urban agriculture introduced it will be more scope for the agri business as well as for creation of employment.

**Consumption Pattern of Vegetables**

**Table 4:** consumption Pattern of vegetable (N=80)

| *Quantity of vegetables consumed* | *No* | *percentage* |
|---|---|---|
| Less than ¼ kg/day | 10 | 12.5 |
| ¼ to 1/2kg/day | 23 | 28.75 |
| ½ to 1kg/day | 38 | 47.5 |
| More than 1 kg/day | 9 | 11.25 |
| Total | 80 | 100 |

It can be observed from Table 4 that 12.5 per cent urban population consumes vegetables per day, 28.75 per cent population consumes vegetables 1/2kg per day, where as 14.5 per cent population consumes vegetables 1kg/day, followed by 11.25 per cent population consumes vegetables more than 1kg per day. It will indicate that low consumption pattern results poor nutritional status, and also depends upon the purchasing power of the families as well as fluctuation in the price of vegetables.

**Table 5:** Consumption Pattern of Fruits (N=80)

| *Quantity of Fruits consumed per day* | *No* | *Percentage* |
|---|---|---|
| Less than 500g | 32 | 40 |
| 500g to 1000g | 33 | 41.25 |
| 1000g to 1500g | 10 | 12.5 |
| More than 1500g | 5 | 6.25 |
| Total | 80 | 100 |

It is evident from the above table 5 that 40 per cent the population consumes fruits up to 500g per day, 41.25 per cent the population consumes 1000g fruits per day and 12.5 per cent population consumes 1500g of fruits per day followed by 6.25 per cent population consumes fruits per day. Considering large urban centers like Khammam these figures highlights poor consumption pattern fruits the results in poor nutritional status, hence introduction of extension efforts through literature support can help to promote urban agriculture.

**Consumption pattern of Milk**

**Table 6:** consumption pattern of Milk among urban population (N=80)

| *Quantity of Milk consumed per day* | *No* | *percentage* |
|---|---|---|
| Half liter to one liter | 25 | 31.25 |
| One to two liter | 45 | 56.25 |
| More than two liters | 10 | 12.5 |
| Total | 80 | 100 |

The data presented in Table 6 indicates that 56.25 per cent the urban population consume one to two liters of milk per day fallowed by half liter to one liter (31.25%) of the respondents consumes less than one liter per day. Milk is one of the important food products which have complete nutrition. Most of the milk supplied which is generally not the fresh milk of the day or adulterants like water may be added. Hence promotion of urban dairy farms can help the urban population in getting fresh milk.

**Attaining places of Fruits and Vegetables**

**Table 7:** Attaining places of vegetables among urban population (N=80)

| *Attaining places* | *No* | *Percentage* |
|---|---|---|
| Push cart | 15 | 18.75 |
| Small Retail shops | 20 | 25.00 |
| Rythu Bazars | 22 | 27.50 |
| Super markets | 23 | 28.75 |
| Total | 80 | 100 |

It can be observed from the result presented in Table 7, that 28.75 per cent of respondents purchase required vegetables from super markets and Rythu Bazars(27.50% ) followed by 25 per cent from Retail shop and 18.75 per cent from push cart. The data reveals that most of the population depends on larger markets rather than push cart. This may be due to the availability of variety of vegetables at a single place, low prices, quality of vegetables, convenience of shopping etc.

**Table 8:** Attaining places of Fruits among urban population (N=80)

| *Attaining places* | *No* | *Percentage* |
|---|---|---|
| Push cart | 12 | 15.0 |
| Small Retail shops | 18 | 22.5 |
| Fruit markets | 32 | 40.0 |
| Super markets | 18 | 22.5 |
| Total | 80 | 100 |

The pattern above reveals that the majority (40 per cent) of the population purchase required fruits from Fruit markets fallowed by (22.5 per cent) super markets and small retail shops and 15 per cent population purchase from push cart. The data reveals that most of the population depends on Fruit markets rather than push cart. This may be due to the availability of variety of fruits at a single place, lower price, quality of vegetables, convenience of shopping etc.

**Table 9:** Attaining places of Milk among urban population (N=80)

| *Attaining places* | *No* | *percentage* |
|---|---|---|
| Near the Houses | 14 | 17.5 |
| Small Retail shops | 20 | 25.0 |
| Dairy forms | 28 | 35.0 |
| Super markets | 18 | 22.5 |
| Total | 80 | 100 |

It can be observed from the result presented in Table 9, that 35 per cent of the respondents required quantity of Milk from Dairy forms, 25 per cent respondents from small Retail shops fallowed by (22.5%) from super markets and 17.5 per cent from near the houses. The data reveals that most of the population depends on Dairy forms, small Retail shops and super markets; this may be due to the abundant availability of a variety of Milk packets and convenience for shopping.

**Frequency of purchase of Fruits, vegetables and Milk**

**Table 10:** Frequency of purchase of Fruits, vegetables among urban population (N=80)

| *Frequency (kg/liters)* | *Fruits* | | *Vegetables* | | *Milk* | |
|---|---|---|---|---|---|---|
| | No | % | No | % | No | % |
| Daily | 5 | 6.25 | 10 | 12.5 | 18 | 22.5 |
| Alternative days | 18 | 22.5 | 22 | 27.4 | 25 | 31.2 |
| Weekly once | 22 | 27.5 | 37 | 46.2 | 28 | 35 |
| More than one week | 35 | 43.7 | 11 | 13.7 | 9 | 11.2 |
| | 80 | 100 | 80 | 100 | 80 | 100 |

It can be observed from Table 10, that majority of the respondents purchased fruits, vegetables and milk once in weekly, followed by alternative days. Minority of the respondents purchases fruits, vegetables and milk daily.

The above pattern reveals that the urban population spent their time and resources to purchase fruits, vegetables and milk either weekly, or alternatively. This may be due to non availability of fresh fruits and vegetables daily or non availability or timely availability of resources, and price fluctuations, and they spending energy on storage of fruits, vegetables and milk. Hence if we introduce urban agriculture it helps in reducing the transportation cost, storage cost, price fluctuations in market and also saving of energy and time and getting fresh vegetables.

## 4. Satisfaction levels of Urban Population for Purchasing Fruits, Vegetables and Milk

It is evident from the (Tabel 11),that only 32.5 per cent of the respondents were fully satisfied with timely availability of vegetables,48.75 per cent of the respondent were partially satisfied followed by not timely availability of vegetables[18.75per cent] majority [67.5per cent] of the respondents were found not satisfied with regard to price of the vegetables. Minority [6.25percent] of the respondents were found satisfied with price of the vegetables. And 41.25per cent respondents were found satisfied partially about quantity of vegetables followed by 31.25per cent responds fully satisfied with quality of vegetables.27.5per cent responds were found not satisfied with quality of vegetables. A majority of responds 46.25per cent, and 48.75 per cent of the responds found partially satisfied with quality required and with measurement by the vendors. Minority of respondents 18.75 per cent not satisfied with the requirements where as in measurements 22.5 per cent responds fully satisfied. Approximately all respondents partially satisfied with availability place.

It can be observed from the table that 48.75 per cent respondents fully satisfied with timely availability of fruits followed by partially satisfied [43.75per cent] and not satisfied [7.5per cent].A great majority [53.75per cent] of respondents not satisfied with price of the fruits followed by partially satisfied [48.75per cent] and 29 percent not satisfied with the price of the fruits. A majority [48.75per cent, 45 percent] of the respondents were fully satisfied with quality of fruits as well as quantity required. A minority [5 per cent, 15 per cent] of the respondents were not satisfied with quality of fruits, as well as quality of fruits required.

A majority [51.25per cent] of the respondents partially satisfied with distance of availability place for purchase of fruits and vegetables followed by not satisfied [33.75per cent] distance of availability minority 15 per cent of the respondents fully satisfied with distance availability of vegetables and fruits.

This clearly indicates that satisfaction level of the respondents on various parameters with regard to purchase of fruits varied hence this is a clear case to introduce a system of self production and utilization of perishable products like fruits in the urban environment.

The data presented in Table11. Could be observed that 58.75 per cent respondents were fully satisfied with timely availability of milk. More than half (60 per cent) of the respondents were also fully satisfied with measurement of milk. This may be due to the availability of packed milk from dairy supplied organizations, however 48.75 per cent respondents partially satisfied with price of the milk, followed by 36.25 per cent respondents not satisfied with price of the milk. A majority (63.75 per cent) of the respondents fully satisfied with quantity required followed by partially satisfied (36.25 per cent) a minority( 8.75 per cent) the respondents not satisfied with quantity required by them. 40 per cent of the respondents partially satisfied with distance of availability of milk, followed by (32.5 per cent) fully satisfied.27.5 per cent not satisfied with distance availability of milk.

**Table 11:** Satisfaction levels of Urban Population for Purchasing Fruits, Vegetables and Milk (N=80)

| *S.no* | *Particulars* | *FS* | | *PS* | | *NS* | | *FS* | | *PS* | | *NS* | | *FS* | | *PS* | | *NS* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *NO* | *%* | *NO* | *%* | *NO* | *%* | *NO* | *%* | *NO* | *%* | *NO* | *%* | *NO* | *%* | *NO* | *%* | *NO* | *%* |
| 1 | Timely Available | 26 | 32.5 | 39 | 48.75 | 15 | 18.75 | 39 | 48.75 | 35 | 43.75 | 6 | 7.5 | 47 | 58.75 | 31 | 38.75 | 5 | 6.25 |
| 2 | Price | 5 | 6.25 | 21 | 26.25 | 54 | 67.5 | 8 | 10 | 29 | 48.75 | 43 | 53.75 | 12 | 15 | 39 | 48.75 | 29 | 36.25 |
| 3 | Quantity | 25 | 31.25 | 33 | 41.25 | 22 | 27.5 | 29 | 48.75 | 37 | 46.25 | 4 | 5 | 24 | 30 | 42 | 52.5 | 14 | 17.5 |
| 4 | As per quantity required | 28 | 35 | 37 | 46.25 | 15 | 18.75 | 36 | 45 | 32 | 40 | 12 | 15 | 51 | 63.75 | 29 | 36.25 | 7 | 8.75 |
| 5 | Satisfaction with measurement | 18 | 22.5 | 39 | 48.75 | 23 | 28.75 | 27 | 33.75 | 42 | 52.5 | 11 | 13.75 | 48 | 60 | 23 | 28.75 | 9 | 11.25 |
| 6 | Distance of Availability place | 12 | 15 | 41 | 51.25 | 27 | 33.75 | 18 | 22.5 | 23 | 28.75 | 39 | 48.75 | 26 | 32.5 | 32 | 40 | 22 | 27.5 |

**Table 12:** Readyness of urban population to produce vegetables (N=80)

| *Ready ness of the respondents to produce vegetables* | *YES* | *Percentage* | *NO* | *Percentage* |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Redyness to produce vegetables | 52 | 65 | 28 | 35 |
| Ready to pay for the technical knowledge and other services | 49 | 61.25 | 31 | 38.75 |
| Roof top | 12 | 15 | 68 | 85 |
| Back Yard | 46 | 57.5 | 34 | 42.5 |
| Balcony | 19 | 23.75 | 61 | 76.25 |
| Other open places | 11 | 13.75 | 69 | 86.25 |
| Availability of adequate water for producing vegetables | 35 | 43.75 | 45 | 56.25 |
| Possessing required knowledge to produce vegetable on their own | 25 | 31.25 | 55 | 68.75 |
| Require technical advice to produce vegetables in their surroundings | 29 | 36.25 | 51 | 63.75 |

Note:- FS—Fully satisfied, PS--- Partially satisfied, NS--- Not satisfied

This result clearly indicates that overall satisfaction level of the respondents on purchase of milk is relatively better than the satisfaction level of purchase of fruits and vegetables on various parameters. Since milk is a product of daily use, efforts towards production and supply of the same in urban areas may have to be promoted for supply of fresh and quality milk.

## 5. Readyness of Urban Population to Produce Vegetables

The information relating to the readiness of respondents to produce vegetables on their own presented in Table12.

It is interesting to observe from the table 12 that 65 per cent of the respondents would like to produce their vegetables on their own. A great majority of (61.25 per cent) of the respondents expressed their readiness to pay nominal cost in case for the attaining technical knowledge towards cultivation of vegetables on their own. It was found that majority of the respondents were having some place either on Backyard, Balcony, on the rooftop, and other open places to produce vegetables. A considerable (43.75 per cent) of respondents expressed that there is adequate water for producing vegetables and also 31.25 per cent of the respondents are required knowledge to produce vegetables on their own.

This clearly indicates that many urban population were not fully satisfied with the present way of purchase of vegetables and fruits and milk in terms of Price, quality, timely availability, measurement etc. on the other hand they were ready to produce vegetables and fruit crops on their own and ready to pay nominal cost towards technical knowhow, they also have adequate space and water to produce vegetables to meet their requirements.

Based on the understanding and learning during the study there is a scope for the promotion of urban agriculture to meet the needs of urban population.

## 6. Future scope/Approaches

1. A large scale awareness campaign may be under taken on urban agriculture through various media for the urban population
2. Research activities may be initiated on urban agriculture to evolve different models and location specific technologies on urban agriculture
3. Need to promote schemes to support the concept of urban agriculture in urban areas and cities

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