



Potentials for Urban and Peri-urban Agriculture in Serilingampally Circle, Hyderabad



“Creating a food and
nutritionally secure future”



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Executive Summary

Increased urbanization creates tremendous challenges in the provision of infrastructure, employment, environmental management, food security, nutrition and health. In this context Urban and Peri-urban Agriculture (UPA) can make significant contributions by acting as a

- ✧ Source of livelihoods for a range of urban and peri-urban beneficiaries
- ✧ Means of addressing urban and peri-urban food and nutritional security
- ✧ Means of utilizing bio-degradable urban waste thus facilitating an improvement in the urban environment and the return of recyclable nutrients to UPA production systems
- ✧ Means of re-cycling urban wastewater (*following appropriate risk mitigation options to prevent negative impacts to producers and consumers as well as soil and water resources*)
- ✧ Catalyst for micro-enterprise development
- ✧ Means of achieving gender and social equity
- ✧ Means of achieving optimum land utilization
- ✧ Source of urban micro-ecosystems and ecology by providing green zones and carbon sinks
- ✧ Education tool and means of recreation

In 2005 the RUAF – **Cities Farming for the Future (RUAF-CFF) Project** was initiated to stimulate the participatory and multi-stakeholder formulation and implementation of local policies and action plans on UPA that will support farmers' livelihoods while safeguarding municipal concerns related to health and other issues. The RUAF-CFF Project will directly contribute to achieving MDGs (1 & 7). The **main objectives** of RUAF-CFF programme are to contribute to;

- ✧ urban poverty reduction
- ✧ urban food security
- ✧ improved urban environmental management

- ✧ gender and social equity
- ✧ empowerment of urban and peri-urban farmers and
- ✧ participatory city governance.

In 2006, Serilingampally Municipality (now Serilingampally Circle) was selected as the target municipality for the RUAF-CFF Project. The outputs of a situation analysis in Serilingampally indicate clear constraints and opportunities for UPA. Serilingampally Municipality was constituted in December 1987 by merging 23 revenue villages and covers an area of approximately 101 km² spread over 24 wards. According to the 2001 Census, the total population of Serilingampally was 153,364 an increase of over 112% over the 1991 value. The current population (2007) of the former Serilingampally Municipality is estimated as exceeding 300,000 (Personal Communication: Zonal Commissioner, Mr. A V Dharma Reddy). Further, from January to August 2007 construction permits were approved for over 300 apartments complexes and more than 6,000 individual houses.

Serilingampally: A Case study of food and nutritional insecurity

- ✧ *A rea under agriculture in 2003 as represented by Google Earth Images was 5.57 km². In 2006 based on ground truthing this area had decreased by 61.5% to only 2.0 km² or 2.01% of the municipal area. Agricultural production was dominated by Kharif season paddy cultivation and small scale vegetable production. The loss of the land associated with Gopanpally Tanda removes another significant area of production.*
- ✧ *The results of Customer and Vendor Surveys indicate that Serilingampally is in effect entirely dependent on external agricultural production to meet nutritional demands and as such is 'food insecure'*
- ✧ *Serilingampally residents and particularly low income households have limited financial 'buffering capacity' to counteract externalities that impact on the cost of vegetables and fruits.*

- ❖ *Increased market prices will mean either increased expenditure or if this increase cannot be met, inadequate dietary intake.*
- ❖ *Externalities impacting on vegetable and fruit prices include increasing fuel prices, reduced supply due to climatic factors and continued loss of agricultural land in the hinter-land of Hyderabad due to rapid urbanization and increased production costs including labour costs (due to shortage of agricultural labour through migration to Hyderabad).*

This would suggest that there is tremendous opportunity for locally produced (either at a commercial or household scale) perishable vegetables to meet the increasing market demand and to act as a buffer to escalating food prices

Perceived Constraints to UPA in Serilingampally

- ❖ Lack of understanding on forms, dimensions and location of UPA
- ❖ Lack of knowledge and information on existence of UPA
- ❖ accessible training centre to support urban farmers
- ❖ Lack of extension workers to support urban farmers
- ❖ Lack of skills and ample knowledge in interested individuals/ groups
- ❖ Lack of cultural and traditional background on home gardening
- ❖ No institutional home for UPA

Opportunities and potentials for UPA in Serilingampally

- ❖ Inherent 'food insecurity' and high and increasing market demand for perishable vegetables
- ❖ Low space options including

- ❖ vertical and aerial cultivation methods,
- ❖ terraces/ balconies gardens
- ❖ home gardens in low income communities for food and income security
- ❖ school and institutional gardens
- ❖ edible landscaping
- ❖ hydroponics and organoponics
- ❖ Rainwater harvesting, grey water re-use, treated wastewater re-use (*following appropriate crop selection risk health and environmental risk mitigation measures*)
- ❖ Composting of municipal solid waste

Further, it is envisaged that the promotion of UPA in Serilingampally will act as a catalyst for small and medium enterprises associated with nurseries (vegetables, ornamentals and fruit trees), composting and the local manufacturing of low space and vertical cultivation structures.

Creating an equitable and mutually acceptable policy environment for UPA

Multi-stakeholder processes are increasingly considered an essential element of policy design, development and implementation. It is considered to be critical that people and organizations from a diversity of backgrounds work together in order to achieve sustainable and equitable solutions to the current challenges associated with urban development and the realization of a 'Sustainable City'.

It is envisaged that an equitable and mutually acceptable policy environment for UPA through the multi-stakeholder development of appropriate supportive policies and institutional and financial support mechanisms would pave the way for a sustainable and 'food and nutritionally secure Serilingampally.





1.0 Introduction

Globally, droughts, floods, market and labour opportunities have led to huge shifts in populations from rural to urban areas, especially in developing countries. It is estimated that 88% of the one billion projected growth in the global population by 2015 will take place primarily in cities in developing countries (UNDP, 1998).

Increased urbanization creates tremendous challenges in the provision of infrastructure, employment, environmental management, food security, nutrition and health. In this context Urban and Peri-urban Agriculture (UPA) can make significant contributions by acting as a

- ❖ Source of livelihoods for a range of urban and peri-urban beneficiaries
- ❖ Means of addressing urban and peri-urban food and nutritional security
- ❖ Means of utilizing bio-degradable urban waste thus facilitating an improvement in the urban environment and the return of recycleable nutrients to UPA production systems

- ❖ Means of re-cycling urban wastewater (*following appropriate risk mitigation options to prevent negative impacts to producers and consumers as well as soil and water resources*)
- ❖ Catalyst for micro-enterprise development
- ❖ Means of achieving gender and social equity
- ❖ Means of achieving optimum land utilization
- ❖ Source of urban micro-ecosystems and ecology by providing green zones and carbon sinks as a means of mitigating Climate Change
- ❖ Education tool and means of recreation

1.1 RUAF – Cities Farming for the Future (RUAF-CFF) Project

In 2005 the RUAF -CFF (*Cities Farming for the Future*) Project was initiated to stimulate the participatory and multi-stakeholder formulation and implementation of local policies and action plans on urban and peri-urban agriculture that

MDGs = Million Development Goals

will support farmers' livelihoods while safeguarding municipal concerns related to health and other issues. The RUAF-CFF Project will directly contribute to achieving MDGs (1 & 7)

The main objectives of RUAF-CFF programme are to contribute to

- ❖ urban poverty reduction
- ❖ urban food security
- ❖ improved urban environmental management
- ❖ gender and social equity
- ❖ empowerment of urban and peri-urban farmers and
- ❖ participatory city governance.

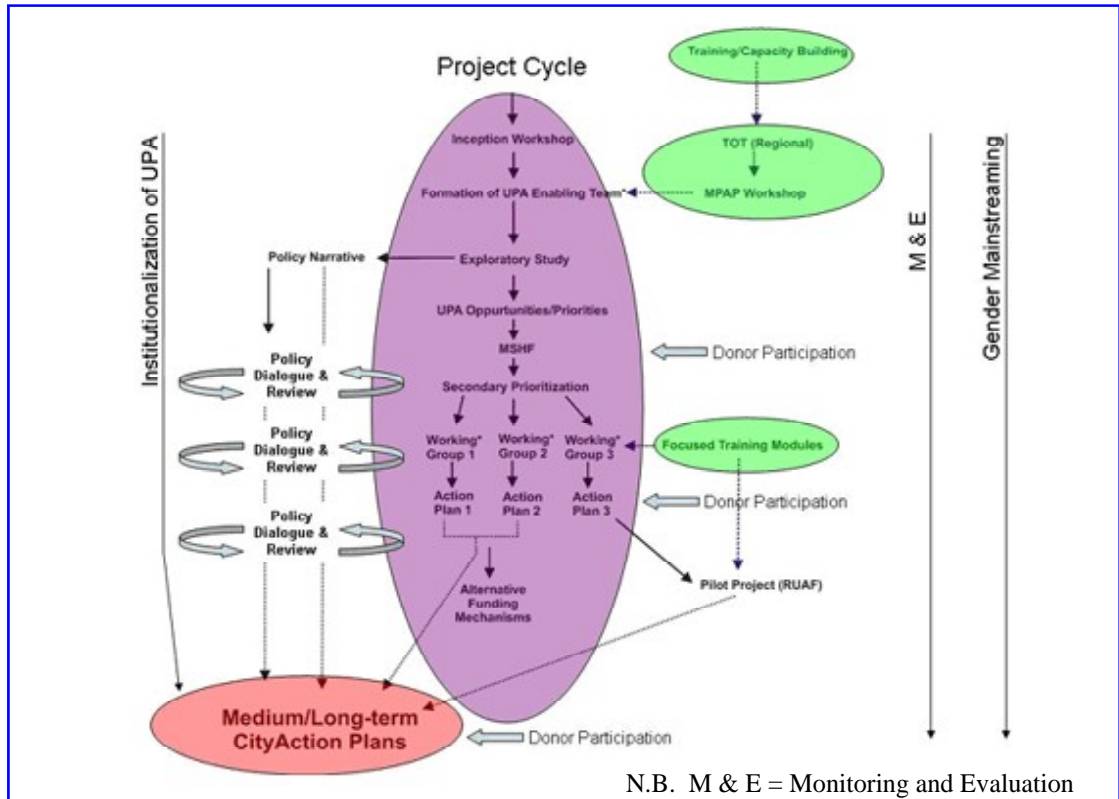
Multi-stakeholder processes are increasingly considered an essential element of policy design, development and implementation. It is considered to be critical that people and organizations from a diversity of backgrounds work together in order to achieve sustainable and equitable solutions to the current challenges associated with urban development and the realization of a 'Sustainable City'.

Therefore, a fundamental component of the RUAF-CFF programme is to establish a Multi-stakeholder Process for Action planning and Policy Design (MPAP) that will create an equitable and mutually acceptable policy environment for UPA.

In each pilot city in the South Asia, namely, Hyderabad and Bangalore in India and Gampaha in Sri Lanka (Figure 1), it is envisaged that the MPAP process will involve the following activities

- ❖ Inception Workshop
- ❖ The establishment of a local city based UPA enabling Team
- ❖ *An exploratory study:* Stakeholder analysis, training and information needs assessment, UPA related situation analysis and policy analysis
- ❖ Strengthen existing capacity through a MPAP/ UPA Capacity Building workshop and sub-sequent stakeholder specific training initiatives
- ❖ Presentation of the findings of the exploratory study to a Multi-

Figure 1. Multi-stakeholder Action Planning Process adopted by the RUAF-CFF Project:



- Stakeholder Forum and at a Policy Awareness Seminar
- ❖ Development of a series of road maps/ action plans that will address key constraints/ opportunities to sustainable and economically viable UPA
- ❖ Initiation of a co-funded Pilot Project in each pilot city as identified during the action planning process
- ❖ Work towards the formation of gender equitable policies that will facilitate the inclusion of UPA in long-term Municipal Planning

1.2 What is Urban and Peri-Urban Agriculture (UPA)?

Conventionally, agriculture is defined as the process of producing food, feed, fiber and other desired products by the cultivation of certain plants and the raising of domesticated animals. The definition of UPA varies on a project basis and as dictated by institutional mandates, policy opportunities and restrictions and, on individual perceptions.

FAO-COAG (1999) states that: “Urban and Peri-Urban Agriculture are agriculture practices within and around cities which compete for resources (land, water, energy and labour) that could also serve other purposes to satisfy the requirements of the urban population”.

Mougeot, 2000 defines urban agriculture as the growing of plants and the raising of animals for food and other uses within urban and peri-urban areas, as well as the related production

of inputs and the processing and marketing of products.

IDRC (International Development Research Centre) Canada gives the definition of UPA as: “Urban and Peri-Urban agriculture or UPA is an industry located within or on the fringe of a town, a city or a metropolis, which grows or raises, processes and distributes, diversity of food and non food products, (re) using largely human and material resources, products and services found in and around the urban areas”.

The most important characteristic of urban agriculture is not its location, but the fact that it is part of and interacts with the urban ecological and economic system. UPA is embedded in and interacting with the urban ecosystem. Such linkages include the use of urban residents as labourers, use of typical urban resources (like organic waste as compost and urban wastewater for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc.

1.3 Urban and Peri-Urban Agriculture: A global perspective:

Globally, an estimated *800 million* people are engaged in some form of urban farming, whether tending home gardens or working in commercial livestock, aquaculture, forestry or greenhouse operations (New Agriculturist on line report (www.new-agri.co.uk)). Table 1 summarizes examples of the global contribution extent of UPA.



Table 1: Global scenario of UPA contribution to the cities in terms of livelihoods and income generation and food security

Livelihoods and Income Generation	
City	Examples & Case Studies
Dakar, Senegal	More than 15,000 jobs are generated through UPA activities. There are more than 4000 family vegetable farms and more than 250 poultry units.
Dar Es Salaam, Tanzania	UA forms at least 60% of the informal sector and is the second largest urban employer. 35,000 households depend on fruit and vegetable production for income.
Kampala, Uganda	Approximately 30% of the households are engaged in UPA, 75% of which are female headed households
Governador Valadares Brazil	45% of the population practices a form of UPA. It amounts to 1.17 % of the GDP
Rosario, Argentina	More than 10,000 families are involved in Urban Farming. More than 3,500 families are involved in marketing, obtaining a monthly income ranging from 40 USD to 150 USD
Cagayan De Oro , Philippines	About 40% households are engaged in some form of UPA. 96% of the elementary schools practice UPA. Cagayan De Oro has an allotment garden program, which enables multiple functional land use such as food security, income generation, nutrient recycling of biodegradable household wastes as well as being used as a place for community and family affairs.
Shanghai, China	2.7 million farmers are practicing UPA. The income from UPA contributes to 2 % of the GDP.
Food Security	
Havana, Cuba	In the early 1990s, faced with food shortages and widespread hunger, city dwellers began growing food on rooftops, in schoolyards and in front of office buildings. More than 1.0 million tons of food is now produced within the city limits. Cuba has become a world-class laboratory for organic farming.
Accra, Ghana	90% of the perishable vegetables are produced within the city limits
Addis Ababa, Ethiopia	79% of milk and 30% of vegetables required by the city are produced within the city.
Dar Es Salaam, Tanzania	90% of leafy vegetables, 60% of the city daily milk supply are produced within the city limits
Harare, Zimbabwe	60% of the city requirement for vegetables, milk and meat are produced within the city.
Hanoi, Vietnam	80% of fresh vegetable, 50% of pork, poultry, and fresh water fish and 40% of eggs of city daily requirements are farmed in the city.
Shanghai, China	60% of cities vegetables, 90% of the city's eggs, 100% of city's milk and 50% of the pork and poultry meat come from within the city.
Socio-Economic Issues	
Mumbai	Development of city farms by street children was launched in Mumbai to improve the socio-economic condition of destitute children through integrated environmental management.
Kolkatta	The fish farming taking place in Calcutta's wetland supplies one fifth of greater Calcutta's fish. The city sewage that feeds the ponds is appropriately treated through methods developed by fishermen over the years.

1.4 What are the various forms of UPA?

Urban and Peri-Urban Agriculture (UPA)

What is Urban and peri-urban agriculture (UPA)?

UPA is the growing of plants and / or the raising of animals for food and other uses (eg: recreation, environment improvement) within urban and peri-urban areas, as well as the related production of inputs and the processing and marketing of products.

UPA and rural agriculture are part of continuum and two interact and compliment each other.

IDRC (International Development Research Centre) Canada defines UPA as:

An industry located with in or on the fringe of a town, a city or a metropolis, which grows or raises, processes and distributes, diversity of food and non food products, (re) using largely human and material resources, products and services found in and around the urban areas.

UPA occurs within and surrounding the boundaries of cities throughout the world and includes crop and livestock production, fisheries and forestry, as well as the ecological services they provide. Often multiple framing and gardening systems exist in and near a single city.

UPA is estimated to involve 800 million urban residents worldwide in income-earning and/or food-producing activities. The findings of national censuses, household surveys and research projects suggest that up to two-thirds of urban and peri-urban households are involved in agriculture. Much of the food produced is for own consumption, with occasional surpluses sold to local markets.

UPA can contribute to Food security in several ways. It increases the amount of food available and enhances the freshness of perishable foods reaching urban consumers (case studies have shown differences in nutrition, especially among children, when poor urban families farm).

The lead feature of UA which distinguishes it from rural agriculture is its integration into the urban economic and ecological system. Modern UA is a life line. At micro level it provides the urbanites with better diet and higher income as well as opportunities to contribute to the urban environment.

UPA has the potential to efficiently recycle the nutrients from municipal solid wastes and waste water.





2.0 Hyderabad: Background summary to urbanization

Hyderabad is the capital city of the state of Andhra Pradesh (5th largest state in India, both in terms of area and population) located in South India in the heart of the Deccan Plateau located 536 meters above sea level. At the time of ground truthing for situation analysis (December 2006) Hyderabad was India's 6th largest metropolitan city and in terms of world ranking stands at number 40. However, in April 2007 the state government of Andhra Pradesh issued notification for the establishment of the Greater Hyderabad Municipal Corporation (GHMC) resulting in the creation of a 625 km² metropolis second only to New Delhi.

In 2001, the population of the Hyderabad Urban Agglomeration (HUA) stood at 5.716 million registering a growth of 31 % over 1991 (Table 2). However, it is important to note that the growth rate varies significantly with the growth rate of MCH being 18.7% as compared to growth rates of 112.2% and 116.8% for Serlingampally and Qutubullapur, respectively. Population densities for the aforementioned

areas of Hyderabad are 20,920, 4,443 and 1,581 person's km², respectively (Table 2).

Hyderabad Urban Agglomeration is located within Ranga Reddy District. Bordering the peri-urban limits of HUA north of Ranga Reddy District and towards the east/ west of HUA (adjoining Quthbullapur, Medchal and Shamirpet) is Medak District and towards the east/ west of Ranga Reddy District south of HUA (bordering Ghatkesakr, Keesara and Balangar) is Nalgonda District. The average daytime temperature in Hyderabad ranges from 25-30°C during November to February and 40-45°C during April-June. Annual precipitation is between 700-1000 mm yr⁻¹ and falls predominantly during the 4 months of July to October. Soils are dominated by Red Sandy Soils with areas of Black Cotton Soil.

In April 2007 the state government of Andhra Pradesh (A.P.) issued notification for the establishment of the GHMC. All 12 municipalities surrounding the state capital have now been merged with the Municipal

Table 2. Area, population and growth of Hyderabad Urban Agglomeration (1991-2001)

Components of HUA	Area (km ²) 2001	Population		Growth Rate (1991-01)	Density- (Persons km ²) 2001
		1991	2001		
A. Municipal Corporation of Hyderabad (MCH)	172.68	3,043,896	3,612,427	18.7	20,920
B. Surrounding Municipalities					
1. Alwal	26.32	66,471	93,206	40.2	3,541
2. Kapra	43.81	87747	159002	81.2	3,629
3. Kukatpally	43.12	186963	292289	56.3	6,779
4. L.B.Nagar	64.61	155514	268689	72.8	4,159
5. Malkajgiri	16.75	127178	193863	52.4	11,574
6. Qutubullapur	52.02	106591	231108	116.8	4,443
7. Rajendranagar	50.87	84520	143240	69.5	2,816
8. Serlingampally	96.99	72320	153364	112.1	1,581
9. Uppal	21.97	75644	117217	55.0	5,335
10. Gaddiannaram	2.12	35187	52835	50.2	24,922
B. Total	418.58	998135	1704813	70.8	4,073
C. Secunderabad Cantonment	40.17	171148	206102	20.4	5,131
D. Osmania University	2.85	10153	11224	10.5	3,938
E. Other Census Towns					
1. Patancheru	15.06	26862	40273	49.9	2,674
2. R.C. Puram	19.28	46129	52363	13.5	2,716
3. R.C. Puram (BHEL)	11.21	17707	14815	-16.3	1,322
4. Ameerpet	4.04	5089	12935	154.2	3,202
E. Total	49.59	95787	120386	25.7	2,428
F. Outgrowths (OG)	94.38	44191	62028	40.4	657
Grand Total	778.17	4,363,310	5,716,980	31.0	7347

Source: Census of India, Andhra Pradesh & HUDA (2003)

Corporation of Hyderabad to create the GHMC, which will have a population of 6.7 Million. As a result, the municipalities of L.B. Nagar, Gaddiannaram, Uppal Kalan, Malkajgiri, Kapra, Alwal, Qutbullapur, Kukatpally, Serlingampalli, Rajendranagar, Ramachandrapuram and Patancheru have been abolished.

The new unit is headed by a senior officer of the rank of Special Commissioner. The GHMC has been created to ensure improved service delivery in the surrounding areas and better inter-departmental and inter-agency coordination. The institutional mandates of HUDA and the newly established GHMC are yet to be defined.

2.1 Urbanization process

Prior to the establishment of GHMC, Hyderabad Urban Agglomeration consisted of the MCH, 10 municipalities and a vast area under Gram Panchayat. In order to plan for this composite area, the Government of Andhra Pradesh constituted the “Hyderabad Urban Development Authority” on 2nd October 1975. HUDA has prepared two master plans and 20 Zonal Development plans for this area of which one master plan and 18 Zonal Development plans are already notified by law and in force.

HUA (Prior to the formation of GHMC) was spread over the whole of the Hyderabad Urban Development Authority (HUDA) area of jurisdiction an area of 1348 km². HUDA covers the entire District of Hyderabad and parts of Ranga Reddy and Medak districts, it included 173 km² under Municipal Corporation of Hyderabad (MCH) 416 km² under 10 Municipalities and 759 km² under 105 gram panchayats. Further, during 1988 to 1999 the built up area increased from 49.3 to 62.4 % of the total geographical area of the HUA. This occurred primarily in Serilingampally, Meerpet

and Qutubullapur, with growth rates of 112.1, 154.2 and 116.8, respectively (Table 2).

Agricultural land to the extent of about 128 km² was converted to residential, commercial, institutional and industrial purposes during the period from 1973 to 1996. With the urbanization process, the radius of the HUA has expanded into the surrounding vacant lands and even water bodies. Over the period from 1973 to 1996, the area under water bodies reduced from 118 to 110 km² (Ramachandraiah C. and Prasad S, 2004). According to the 2001 statistics, HUA has a population of 6 million, a 17.2 % increase over the population of 1991 making it one of the fastest growing urban areas in India.

2.2 Hyderabad Urban Agglomeration (GHMC) Land Use Classification:

In 1999-2000 HUDA launched a joint project with the NRSA, Hyderabad to update not only base maps but also as landuse maps for the non MCH area. IRS Satellite (LISS III + PAN) were utilized with ground verification undertaken in 2000. The results of the landuse classification are given in Table 3 and Figure 1.

Table 3. Landuse classification of Hyderabad Urban Agglomeration (2000).

Land Use Categories	Non MCH areas HUDA-2000 NRSA (km2)	% of total non-MCH HUDA Area	MCH area (km2)	% of total MCH area	Total HUDA	area (km2)
Residential	143.28	8.47	75.20	43.57	218.5	11.7
Residential (Plotted)	70.89	4.19	0.00	0.00	70.9	3.8
Commercial	1.52	0.09	20.60	11.94	22.1	1.2
Manufacturing	60.81	3.59	3.07	1.78	63.9	3.4
Public & Semi Public	87.59	5.18	23.48	13.60	111.1	6.0
Utility	1.56	0.09	0.00	0.00	1.6	0.1
Open	0.77	0.05	7.63	4.42	8.4	0.5
Agriculture & Vacant Lands	1117.73	66.05	20.10	11.65	1137.8	61.0
Forests	88.41	5.22	0.00	0.00	88.4	4.7
Water bodies	84.3	4.98	8.63	5.00	92.9	5.0
Transportation & Communication	35.41	2.09	13.48	7.81	48.9	2.6
Total	1692.27	100	172.6	100.0	1865	100.0

Source: HUDA (2000)

Figure 1. Percentage of HUDA (not including MCH) under selected landuse classes (2000)

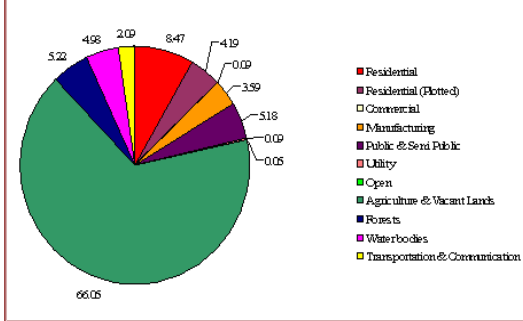
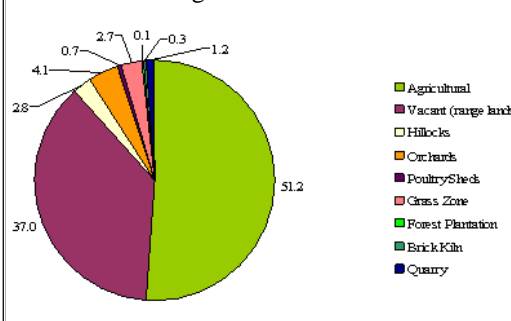


Figure 2. Detailed breakdown of the 'Agricultural and Vacant Lands' component of Figure 1



The results of the HUDA-NRSA landuse mapping initiative are given in Figures 1 and 2. As indicated in Figure 1 66.05% of the HUDA area was classified as 'Agricultural and Vacant Lands'. However, this is misleading as demonstrated in Figure 2. Of the 66.05% of land classified as 'Agricultural and Vacant Lands', only 51.2% or 582.14 km² is classified as agricultural. It is also of interest to note that in 2000, 11.65% of the MCH area was also classified as 'Agricultural and Vacant Lands'.

The HUDA 'Vision 2020' also put forward the proposed land use classification for 2020. Under this vision it is proposed that the 'Conservation/ Agriculture' land use category will be cut by 56.1% from 1117.73 km² in 2000 to 491 km² in 2020. Of this 626.74 km² re-classification of landuse approximately 45.6% or 286.4 km² is to be allocated as residential and 20.15% or 126.27 km² for transport and communication (Table 4).

Table 4. HUDA 'Vision 2020': Proposed land use classification for 2020

Land Use Categories	Landuse based on NRSA satellite images 2000 (km ²)	Proposed landuse 2020	% of HUDA Area	Proposed change in area 2000 and 2020 (km ²)
Residential (Including Plotted)	214.17	500.57	29.58	286.40
Commercial	1.52	33.50	1.98	31.98
Manufacturing	60.81	74.69	4.41	13.88
Public & Semi Public	87.59	131.92	7.80	44.33
Multiple Uses	0	15.07	0.89	15.07
Utility	1.56	3.31	0.20	1.75
Open	0.77	96.57	5.71	95.80
Conservation/ Agriculture Group	1117.73	490.99	29.01	-626.74
Forests	88.41	88.44	5.23	0.03
Water bodies	84.3	95.44	5.64	11.14
Transportation & Communication	35.41	161.68	9.55	126.27
Total	1692.27	1692.27	100.00	0.00

Source: HUDA (2000)



3.0 Serilingampally Municipality: Focused Case Study

Serilingampally Municipality was constituted in December 1987 by merging 23 revenue villages and covers an area of approximately 101 km² spread over 24 wards. According to the 2001 Census, the total population of Serilingampally was 153,364 an increase of over 112% over the 1991 value (Table 1). The current population (2007) of Serilingampally is estimated as >300,000 (Personal Communication: Zonal Commissioner, Mr. A V Dharma Reddy).

Further, from January to August 2007 construction permits were approved for over 300 apartments complexes and more than 6,000 individual houses. Assuming an average family size of 5 persons the 6,000 individual houses would equate to a population of 30,000. Assuming that the apartment complexes have an average of 50 flats per complex and an average family size of 5 persons this would equate to a population of approximately 75,000. Rapid urbanization in Serilingampally is manifested in escalating land prices (Table 5). This is a key driver for the shift from agricultural to residential and commercial landuse.

Following the formation of the GHMC in April 2007, the municipalities of L.B. Nagar, Gaddiannaram, Uppal Kalan, Malkajgiri, Kapra, Alwal, Qutbullapur, Kukatpally, Serilingampally, Rajendranagar, Ramachandrapuram and Patancheru were abolished. The former municipalities of Serilingampally, Kukatpally, Qutubullapur, Rajendranagar now form the western Zone of GHMC which is administered by Mr. A V Dharma Reddy. Further, Serilingampally has been divided into two circles. Circle 1 is administered by the Deputy Zonal Commissioner Ms. Nagaveni and Circle 2 by Deputy Zonal Commissioner Mr. V. Manohar.

Serilingampally is an important Commercial, Industrial and educational hub of the city. Institution such as Hi-Tech City, The National Academy of Construction (NAC), Indian Institute of Information Technology (IIIT), Indian School of Business (ISB), National Institute of Fashion Technology (NIFT), Computer Maintenance Center (CMC), Infosys, Microsoft, Wipro, Indian Immunologicals

Table 5. District wise land prices (November, 2006) in and around Hyderabad

Municipality	Land Prices (Rs) sq yard	Rs per acre	US\$ per acre
Serilingampally	6000	29,040,000	638,241
MCH	1500	7,260,000	159,560
Kukatpally	1500-2250	7,260,000 - 10,890,000	159,560 - 239,340
Malkajgiri	4200	20,328,000	446,769
Alwal	1000	4,840,000	106,373
Khapra	3000-4500	14,520,000 - 21,780,000	319,120 - 478,681
L B Nagar	2250	10,890,000	239,340
Qutubullapur	800	3,872,000	85,098
Rajendranagar	1800	8,712,000	191,472
Uppal	1500-2250	7,260,000 - 10,890,000	159,560 - 239,340
Uppal x road upto Musi River 60' depth	5000	24200000	531,868

Source: www.igrs.ap.gov.in

Limited, Hyderabad Central University, and many more industrial and commercial centers are located in this municipality.

3.1 Selection of Serilingampally Municipality

Based on the outcomes of the MPAP activities in Hyderabad in 2005 and RUAF-CFF Program Committee Meeting in 2006 it was agreed to focus activities in Hyderabad on a target Municipality whilst still maintaining City wide awareness programs, advocacy and policy dialogue.

The identification of a suitable Municipality was based on a selection criterion. IWMI-RUAF team members visited 4 pre-selected Municipalities and provided the authorities (Municipal Officials) with the selection questionnaire. The pre-selected municipalities namely Rajendranagar, Qutubullapur, Kukatpally and Serilingampally were chosen as being representative of Peri-Urban Municipalities that are

- ✧ considered to be 'urban'
- ✧ have a low proportion of the population involved in agricultural activities
- ✧ have a high proportion of the population Below Poverty Line (BPL)

- ✧ have a high market potential for horticultural products and existing market infrastructure
- ✧ still retained areas of agricultural production
- ✧ perception that UPA was not viable

The work of selection was carried out through 6 follow up visits under taken from the period 22nd – 28th of March. Meetings were held with the Commissioner, Project Officers and Health Officers of the respective municipalities. At the end of exercise, Serilingampally municipality was short listed as the most appropriate municipality for undertaking and implementing the RUAF activities.

Serilingampally was chosen as suitable area for RUAF for the following reasons:

- 1 The Municipal Commissioner and project officers of Serilingampally municipal authority showed strong interest in the project in terms of carrying out the activities within the municipality.
- 2 Serilingampally represents a rapidly urbanizing municipality with the associated increased demand for perishable products, increased generation of municipal solid waste

and wastewater, availability of local capacity/ skills in agriculture and competition with non-agricultural employment opportunities. Areas of UPA can still be found (associated with fertile soils and available water resources) as well as small-scale dairy activities.

- 3 Serilingampally is included as a municipality in the DFID and Andhra Pradesh State Government funded (1407.47 Crore Rs (312.77 Million US\$)) project 'Andhra Pradesh Urban Services for the Poor'. The APUSP Project is being undertaken in 42 Municipalities in Andhra Pradesh. APUSP project is subdivided into 3 components C1 Municipal Performance Improved through Reforms; C2 Environmental Infrastructure Improvement; C3 Strengthening Civil Society Organizations. Specifically under C3 component the APUSP Project will focus on livelihood improvement of urban poor with a focus on women's SHGs namely;
 - ❖ Skill up-gradation training on income generation activities to the poor
 - ❖ Creation of self employment opportunities
- 4 Discussions were held with the Serilingampally APUSP Project Officer (Mr. Venkat Kishan Reddy) and the APUSP Project Coordinator (Mr. Janardhan Reddy) in June 2006. The role of UPA as a means of providing HH food security and as a means of income generation (as well as reducing HH expenditure on vegetables) was discussed. It was agreed to develop linkages between APUSP and RUAFCFF Project activities.

Key challenges facing Serilingampally include

- ❖ Solid Waste Management
- ❖ Sewerage + wastewater treatment and re-use
- ❖ Drinking Water Supply
- ❖ Rapidly expanding population
- ❖ Food and nutritional security
- ❖ Urban poverty

It is envisaged that through multi-stakeholder action planning, that the RUAFCFF project will directly address urban poverty and food and nutritional security as well as solid waste management.

3.2 Where is UPA practiced in Serilingampally?

During 2006 a detailed landuse classification was undertaken of the former Serilingampally Municipality by Mr. Venkata Radha (IWMI). For further details refer to the accompanying CD-ROM.

The results indicate that over 43% of the municipal area is either 'residential' or allocated as 'residential plotted' (Table 6 and Figure 2). Further, over 21% and 29.6% of Serilingampally is considered as 'Institutional Land' and 'Wasteland', respectively.

Remarkably, only 2.01% of the total municipal area is considered to be agricultural land and only 1.16% as water bodies (Figure 3). Effectively therefore, Serilingampally is dependent on outside sources of food. This is confirmed by a market survey conducted in 2006.



Table 6. Breakdown of landuse types in Serilingampally Municipality (2006)

Landuse Categories	Area (km ²)	% of Total Municipal Area
Agriculture Area	2.05	2.01
Residential *	13.23	12.98
Residential (Plotted)	31.87	31.29
Commercial	0.47	0.46
Institutional Area (Public and Semipublic)	22.00	21.60
Waste lands **	30.18	29.63
Water bodies	1.18	1.16
Total Area	100.98	100.00
Area of Serilingampally Municipality	101.86	
Error due to Interpretation	0.88	

* Includes 1.49 km² under 38 slums

** This category includes forest plantations, hillocks/shrub and vacant areas

Figure 2. Current and allocated residential areas in Serilingampally Municipality (2006)

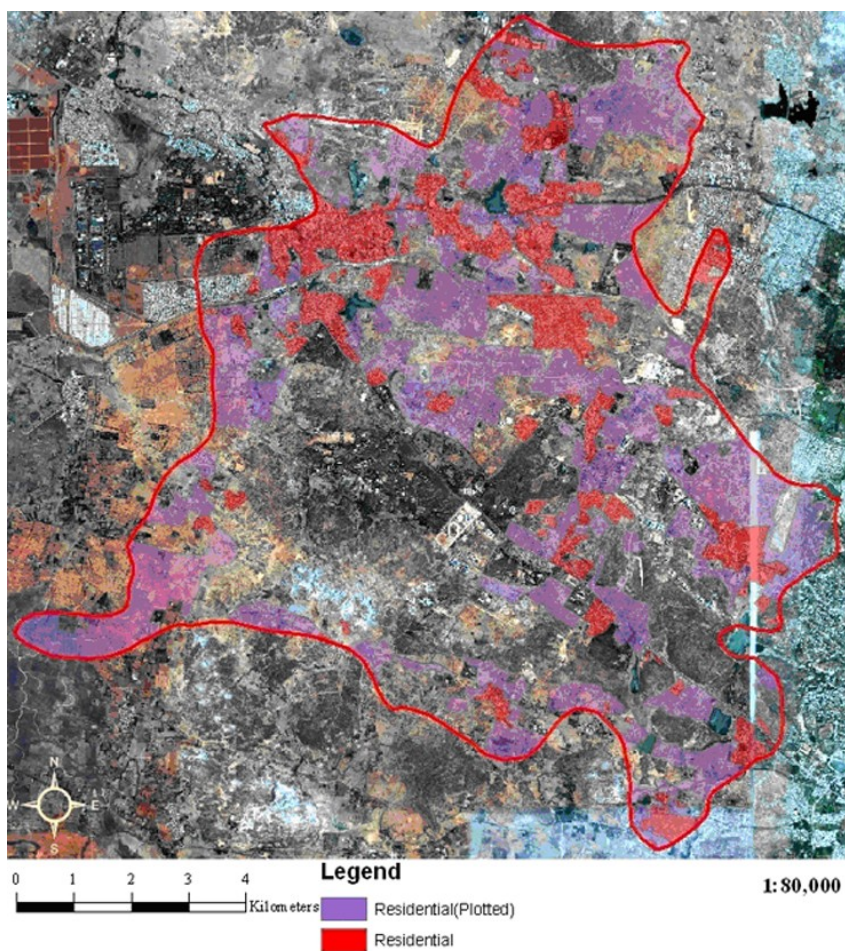
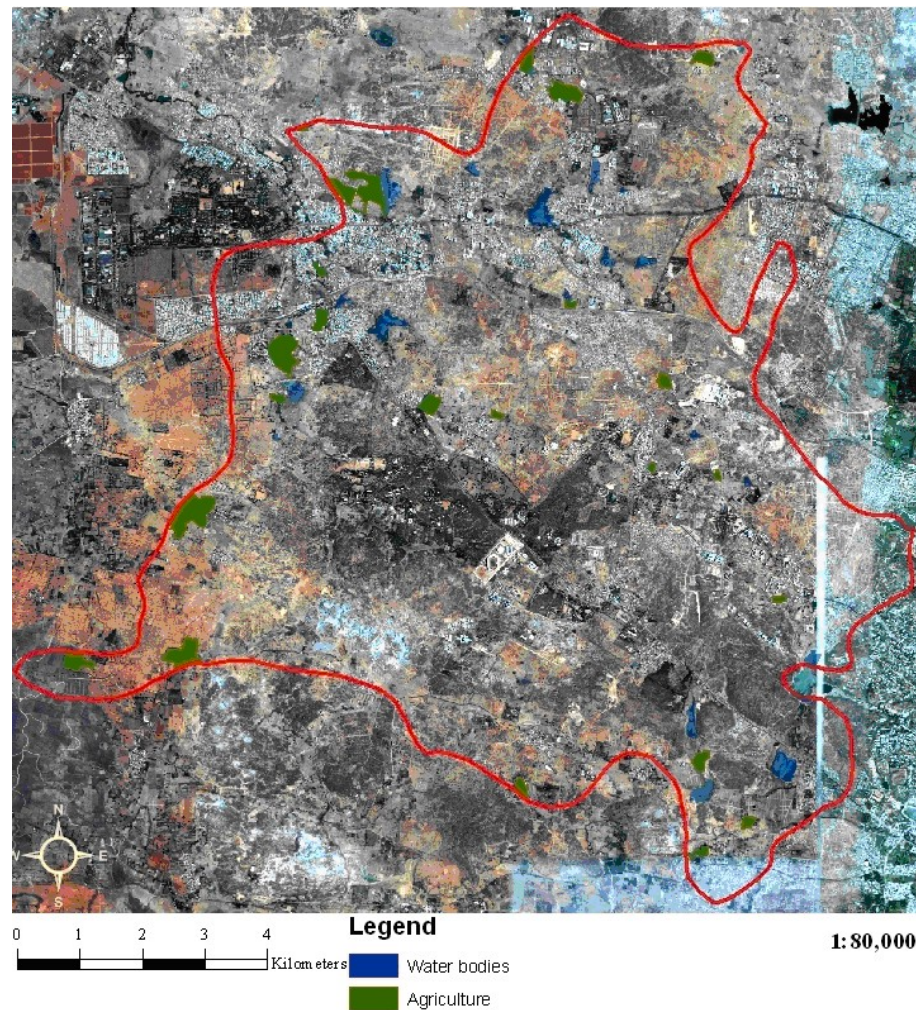


Figure 3. Agricultural areas and water bodies in Serilingampally (2006)



3.3 Actors involved and forms of UPA in Serilingampally?

3.3.1 Case Study: Gopanally Tanda:

In 2006 a questionnaire survey was conducted by students from *Roda Mistry School of Social Work (RMSSW)* under the guidance of the RUAFF-CFF, IWMI team. The survey was conducted in 76 households (53% of households).

Gopanally Tanda is a notified slum in the former Serilingampally Municipality made up of 143 households (HHs) and a total population of 769 (2001 Census) of which 358 are considered as below poverty line (BPL). Gopanally Tanda is a Hindu Scheduled Caste

Lambadi community. Six SHGs exist in Gopanally Tanda under the APUSP project comprising 120 members.

Educational Status:

- ✧ 64% of interviewees indicated that they were illiterate, 10.5% had graduated to Grade 1-5 and 13.2% to 6-10th Grade.
- ✧ Nine individuals had graduated from Intermediate level (x3), vocational technical training (x3) and a BA Degree (x3).

Main income generating activity:

- ✧ 84% of HHs interviewed listed 'agriculture' as their main income generating activity.

A rea cultivated and ownership:

- ✧ The total land area for the 76 HHs interviewed was 200 acres (80.94 ha) with an average land holding of 2.6 acres.
- ✧ Of the HHs interviewed, 92.1% owned their land and 7.9% leased it.
- ✧ Ownership 84.2% men, 7.9% women and 7.9% jointly owned.

Production System:

- ✧ Main crops grown include sorghum (35.53%), paddy (36.84%) and pigeon pea (22.37%). The remaining 5.26% was recorded as Sorghum/Paddy.
- ✧ 46% of HHs interviewed indicated that they included an 'intercrop' in their production system which, was dominated by pigeon pea (43.43% of HHs).
- ✧ Crops are 78.9% rainfed and 21.1% irrigated of which 83.3% was irrigated with tube wells, 10% from open/ dug wells and 6.6% from canal/tanks.
- ✧ 73.68% of HHs applied chemical fertilizers with the remaining HHs applying a combination of chemical fertilizers and farmyard manure.
- ✧ Only 13% of HHs utilized pesticides which were primarily monocrotophus, endosulfan and saifamithanane
- ✧ 66% of HHs purchased seed from Lingampally, 11.1% from Shankarpally and 16.6% from Chandanagr, respectively. A similar trend was observed for fertilizers and pesticides.

Vegetables:

- ✧ 77% of HHs cultivated vegetables of which 74.5% cultivated exclusively tomatoes and a further 11.86% included tomatoes in combination with chillie and/ or potatoes. The remaining vegetables grown (13.64%) include brinjal, onion, ridge gourd, and leafy vegetables.
- ✧ Yields of tomato ranged from 800-1000 kg acre.

Livestock:

- ✧ Only 30% of HHs owned livestock.

- ✧ Total livestock numbers were 17 buffalo, 17 cows, 13 oxen, 13 pigs and 18 chickens.
- ✧ Milk produced is for home consumption (15%) and income generation (85%).

Crops grown and consumed at a HH level and for income generation:

- ✧ 78.9% of HHs cultivated crops for both self consumption and income generation 15.8% for self consumption only and 5.3 % only for retail.
- ✧ Sorghum, paddy and tomato dominate with 28.57%, 21.43% and 28.57% of HHs utilizing a portion of their crop for household consumption. The remaining 21.43% of HHs consumed a portion of their pigeon pea, potato, chillie and onion crop in the order pigeon pea > potato = chillie > onions.
- ✧ Sorghum, tomato and paddy dominate with 26.19%, 26.19% and 14.29% of HHs utilizing a portion of their crop for income generation. The remaining 33.33% of HHs sold a portion of their crop in the order pigeon pea = potato > chillie > onions = brinjal = mungbean.

Marketing:

- ✧ Of those HHs selling produce, **85.7% of HHs** sold produce to Lingampally market with the remaining HHs (14.3%) split between Chandanagr and Shankarpally.

In 2006 a series of focused group discussions were undertaken in Gopanpally Tanda. One of the key outcomes from the FGDs was that the agricultural land of Gopanpally Tanda has been purchased by the A. P. Government for the development of an IT park. Agriculture is therefore no longer a viable livelihood activity. This effectively removes the last remaining significant agricultural production area in Serilingampally. Further, interviewees indicated that it is difficult for them to take up training in Urban and Peri-urban Agriculture (UPA) and capacity building activities as they no longer

have access to land. Further, an increasing percentage of the community are going for more profitable non- agricultural employment and have no time available for training as they would loose their jobs.

In 2002, the A.P. Horticulture Department facilitated kitchen garden training in Gopanpally Tanda. However, no training materials were provided for post training guidance and no follow up was undertaken. Finally, the female interviewees indicated that the time required to manage a family kitchen garden would encroach on existing gender roles and responsibilities and thus increased their workload with little perceived benefit.

3.3.2 Dairies and livestock

Dairy remains an important agricultural activity in the former Serilingampally Municipality. Three veterinary dispensaries are located within the former municipal administrative boundary at Lingampally (Nallagadla), Madhayapur and Nanak Ram Guda. These dispensaries were established by the Department of Animal Husbandry and Dairying [now renamed as Department of Animal Husbandry Dairying & Fisheries (DADF)]. The three dispensaries cover a total of 23 villages and were established under a 'rural' dairy development program and still function in the 'urban' context. The livestock covered by the dispensaries include both large and small ruminants namely, buffaloes, cows, sheep and goats.

Services provided include, free medical service to animals, two annual veterinary camps and meetings of the 'Farmer Science Committee'

(ryatu vignan sadan) which educates farmers on livestock breeding, calf rearing, care of pregnant animals and vaccination schedules. In 2006, between 150 and 160 animals were brought to the dispensaries for treatment. Registered dairies (under the Hyderabad Municipal Corporation Act 1955 amended under Andhra Pradesh Ordinance No. 17 of 1996) can avail of the services provided by the DADF.

On an annual basis a door to door survey is conducted to determine the number and type of livestock in the 23 villages. The results of the 2006 survey indicate that approximately 165 households have buffalo of which 20 households have herds of 10-20 head. The total number of livestock in the 23 villages was estimated as 564 cows, 1,586 buffalo, 890 sheep and 2,003 goats. In addition, free range chickens are often kept with over 3600 recorded in the 2006 survey.

Assuming a daily milk production for buffalo ranging from 8-12 litres per day, approximately 1586 head of buffalo would produce a daily milk production of >15,000 litres. All this milk is sold locally within Serilingampally and also in the surrounding municipal areas like Kukatpally. At a rate of 15-20 INR per litre this amounts to 225,000-300,000 INR per day or between 82 and 109 Million INR per year. This is a significant financial contribution to the local economy. Animal feed for buffalo includes fodder grass [primarily paragrass], groundnut cake and rice bran. Green fodder is purchased from the Golnaka Green Fodder market in Uppal and also produced locally.





4.0. Food and nutritional security in Hyderabad and Serilingampally:

There are 4 major vegetable belts, which supply vegetables to the HUA namely, Shamirpet-Vantimamidi, Shamsabad-Shadnagar, Cheverala-Vikarabad and Medchal-Tupram. This production area meets 75 to 80 % of the demand in HUA in the 4 months from October to January. In the remaining 8 months, these vegetable production areas are only able to meet 30% of the demand in HUA. The residual demand in all seasons is met by supply from outside the HUA, from the following belts namely, Ibrahimpatnam to Chowtuppal, Vijaywada-Mangalgiri and Bangalore-Kolar.

Further, Hyderabad is a major trading center for vegetables. There are 13 AMC regulated markets in HUA (6 in Hyderabad and 7 in RR district but part of the HUA) for trading of vegetables. The large number of wholesale vegetable merchants and commission agents cater to the supply of the HUA and also channel the supply to other districts of the state e.g. Karimnagar and also to distant places such as Khammam and Chennai for leafy vegetables. There are 6 *Rythu Bazaars* also established by

the government in different parts of the HUA. The *Rythu Bazaars* are marketplaces where *Rythus* Farmers/ vegetable producers can sell their produce directly. However, around 60 percent are non-producers.

However and critically, high land values and conversion of land from agricultural to residential uses has resulted in escalating vegetable prices in Hyderabad. In addition, agricultural labour is being increasingly drawn into the construction industry due to higher wages and consistent employment. Ms. Geeta Reddy (Assistant Director of Horticulture) of the A.P. Horticulture Department in an interview to "The Times of India (7th February 2007) indicated that in 2006 there was a 15% drop in the production of vegetables in Ranga Reddy District. During 2003-4, 3.11 Million tonnes of vegetables were grown in Ranga Reddy District on approximately 25,581 ha of land. In 2005-6, the area under vegetable production had declined to 14,313 ha and the vegetable production decline to 2.28 Million tonnes. This is a massive 45% decrease in the

area under vegetable cultivation. The production of vegetables has declined primarily in Shameerpet, Medchal, Moinabad, Chevalla, Shankarpally, Kandukur and Ranjendranagar Mandals.

4.1 Market Survey in Serilingampally: Is there potential for local vegetable production in Serilingampally?

In 2006, a primary survey was undertaken evaluate the source of vegetables to Serilingampally municipality and the spatial distribution of the consumer who depend on the markets in the municipality. A questionnaire based survey was undertaken in Lingampally (daily market), Miyapur (weekly market) and at Nalagadla wholesale market (daily from 5.30-9.00 AM). In total 150 vendors in Lingampally, 100 vendors in Miyapur and 40 in Nalagadla market were surveyed. Further, 100 consumers were interviewed in Miyapur and Lingampally markets. The entire survey was done by the students of RMSSW under the guidance of the RUAF-CFF IWMI team.

The results of the Serilingampally indicate that 100% of the customers surveyed (n=150) purchased vegetables (Figure 4) of which over 80% purchased tomatoes, ladies finger (Okra), brinjal, and Karivepaku (curry leaf) and Kothimeer (coriander). Over 30 types of vegetables are sold in Serilingampally Market dependent on seasonal availability. Further, of the customers surveyed 57.9%, 34.2%, 74.3% and 80.9% purchased fish, flowers, fruits and meat (chicken and/ or mutton) on average >3 times per week (Figure 5).

Figure 4. Serilingampally customer survey (n=150) 2006: Percentage of customers purchasing vegetables, fish, flowers, fruits and meat.

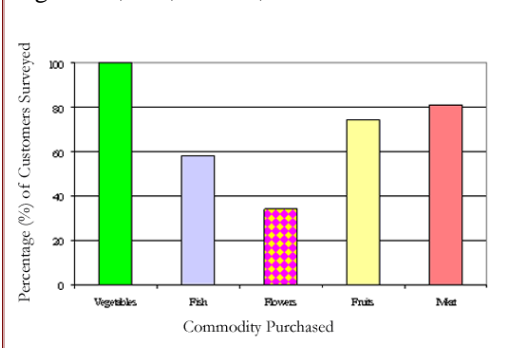
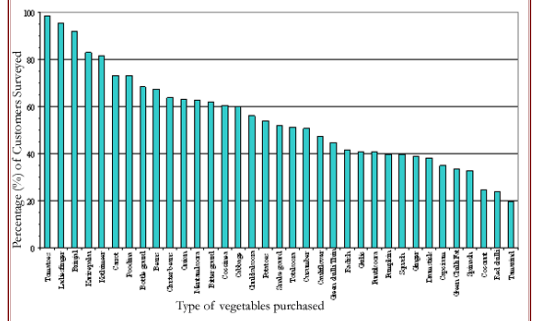
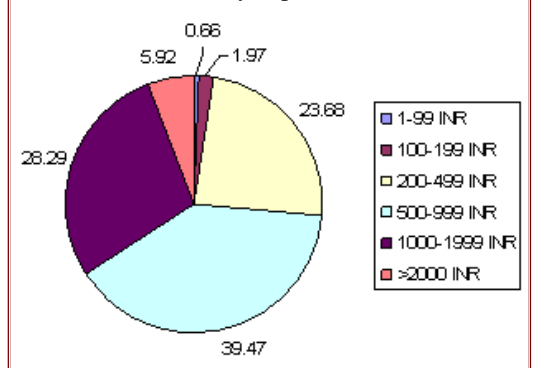


Figure 5. Serilingampally customer survey (n=150) 2006: Percentage (%) of customers purchasing various types of vegetables.



On average 23.68%, 39.47% and 28.29%, of customers visiting Serilingampally market spent between 200-499INR, 500-999INR and 1000-1999 INR per month, respectively (Figure 6). Of the total monthly expenditure on produce from Serilingampally market, on average **50.33%** (ranging from 40-75%) was used for purchasing vegetables followed by fruits = meat > fish.

Figure 6. Percentage of customers (n=150) in selected monthly expenditure classes.



Similarly, the results of the Miyapur (weekly market) indicate that 100% of the customers surveyed (n=130) purchased vegetables. Of the customers surveyed 44.4%, 32.3%, 50.4% and 59.4% purchased fish, flowers, fruits and meat (chicken and/or mutton).

Further, on average 24.81%, 45.74% and 20.16%, of customers visiting Miyapur (weekly market) spent 200-499INR, 500-999INR and 1000-1999 INR per month, respectively. These figures closely match those of Serilingampally market. Of the total monthly expenditure on produce from Serilingampally market, on average **53.66%** (ranging from 40-66.67%) was used for purchasing vegetables followed by fruits = meat > fish.

4.2 Vendor Survey in Serilingampally market

In 2006 a vendor survey was also conducted in Serilingampally market in order to determine the primary sources of vegetables sold. In total 150 vendors were interviewed by students from RMS SW. The main results indicate that 77% and 33% of vendors interviewed were male and female respectively. Further, the majority of vendors (73%) were between the ages of 25-45yrs with 17% and 10% of vendors <25years and >55 years respectively.

With the exception of leafy vegetables, 97.83-100% of vegetables were purchased directly from wholesalers and **not** from farmers. On average the main sources of vegetables for the market vendors were wholesalers within Serilingampally Market (38.1%), Monda Market (31.6%) and Bowenpally Market (21.9%).

In contrast, for leafy vegetables on average 20% of vendors purchased directly from farmers with 62% from wholesalers at Serilingampally (30%) and Monda (32%) markets. The remaining 18% is primarily from Nallaguda (4.2%) and Musapet (4.1%) markets.



4.3 Food and Nutritional Vulnerability of Serilingampally

- ✧ Area under agriculture in 2003 as represented by the Google Earth Images was 5.57 km². In 2006 based on ground truthing this area had decreased by 61.5% to 2.0 km² or 2.01% of the former municipal area. Agricultural production was dominated by Kharif season paddy cultivation and small scale vegetable production. The loss of the land associated with Gopanpally Tanda removes a significant area of production.
- ✧ The results of the Customer and Vendor Surveys indicate that Serilingampally is in effect entirely dependent on external agricultural production to meet nutritional demands.
- ✧ Serilingampally and particularly low income households have limited financial 'buffering capacity' to counteract externalities that impact on the cost of vegetables and fruits. Increased market prices will mean either increased expenditure or if this increase cannot be met, reduced food and nutritional security. Externalities impacting on vegetable and fruit prices include increasing fuel prices, reduced supply due to climatic factors and continued loss of agricultural land and increased labour costs (due to shortage of agricultural labour).
- ✧ This would suggest that there is tremendous opportunity for locally produced (either at a commercial or household scale) perishable vegetables to meet the increasing market demand and to act as a buffer to escalating food prices.



5.0 Policies related to UPA

The Government of India has several programs that seek to reduce unemployment and alleviate poverty including Swarna Jayanti Shahari Rozgar Yojana (SJSRY) which combines the Urban Self Employment Program (USEP) and the Urban Wage Employment Program (UWEP). The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) has also been initiated to address the key issues facing sustainable urban development in India. UPA has a huge potential to employ people and hence can be an efficient means to reduce urban un-employment.

In 2002, M. S. Swaminathan Research Foundation and the World Food Programme released a comprehensive report on the status of food insecurity in **urban India** (<http://www.mssrf.org/fs/atlas/atlas.htm>). The report states that, slums, mounting garbage, menace of mosquitoes, and lack of adequate sanitation are some of the serious concerns in urban areas. The report clearly states that the development of **peri-urban green belts** will go a long way to improving urban amenities. However, in spite

of the fact that UPA has an important role in making cities sustainable, urban agriculture remains marginal in the urban planning process. There is no comprehensive policy which supports and sustains urban farming systems. However, the fifth and final Report dated October 4th 2006 entitled Revised Draft National Policy For Farmers drafted under the Chairpersonship of Dr. M. S. Swaminathan, clearly includes a paragraph on UPA stating that

“Urban home gardens could make a substantial contribution to improving nutrition security through the cultivation and consumption of vegetables and fruits. Home nutrition gardens could be designed for low income groups in such a manner as to provide horticultural remedies to major nutritional maladies. Support services in the form of good seeds and planting material and safe plant protection techniques will be needed. Urban slums need particular attention from the point of view of combating malnutrition through nutrition gardens”.

Policy is an instrument that drives most developments and actions in a governed system. It is a directive which might be driven by legal,

financial and/ or institutional instruments. According to William Jenkins in *Policy Analysis: A Political and Organizational Perspective (1978)*, a policy is ‘a set of interrelated decisions taken by a political actor or group of actors concerning the selection of goals and the means of achieving them within a specified situation where those decisions should, in principle, be within the power of those actors to achieve’. The goals of policy may vary widely according to the organization and the context in which they are made. Broadly, policies are typically instituted in order to avoid some negative effect that has been noticed, or to seek some positive benefit.

In the light of the importance and impacts of policies in a governed system, the support or opposition to an activity comes from the way a policy has been designed. The governing policies play a major role in the activities that can be undertaken, promoted or prohibited, as the environments that policies seek to influence or manipulate are typically complex adaptive systems (e.g. governments, societies, large companies).

Under the project RUAF-CFF, it is recognized that in order to achieve the broader objectives of the project, the policies that promote or inhibit UPA may have a major role to play in the design and implementation of UPA activities.

Consequently, a critical analysis of existing policies, norms and regulations regarding UPA was undertaken as a part of the situation analysis. The analysis includes policy documents, bylaws, ordinances, regulations, etcetera, that deal directly with UPA (e.g. horticulture, aquaculture, community gardening, forestry etcetera) as well as other policies and regulations that have a strong influence on UPA (e.g. land use plans and zonification norms, health regulations, marketing regulations etcetera).

The review of existing policies and regulations regarding UPA is helpful in order to:

- ✧ Identify possibilities to enhance the implementation of existing policies and their effectiveness and/ or

efficiency and/ or their relevance for certain categories of the population (e.g. women and/ or the poor)

- ✧ Identify outdated or unnecessary restrictive norms and regulations regarding UPA (municipal by-laws, ordinances, zoning regulations etc) that should be removed or adapted
- ✧ Identify inconsistencies regarding UPA between different sector policies (e.g. between economic and social development policies and public health and environmental management policies) and between policies at different levels (local versus national in their treatment of UPA that need to be harmonized, as well as of opportunities to integrate UPA better into these sector policies
- ✧ Identify which existing policy measures did or did not work well (effectiveness, enforcement costs etcetera).

As a result, a number of relevant UPA related policies were identified as listed in the Table 7. However, with the exception of the Hyderabad Municipal Corporation Act 1955 (Amendment 1996 through ordinance No.17 of 1996) Stray Cattle Ordinance no policy directly influencing UPA was identified.

This demonstrates the need for a supportive and favourable policy environment for UPA that will facilitate the integration of UPA into urban planning policies. In addition to this, both government and non-government institutions often lack the capacity and coordination to support UPA farmers which could be addressed if suitable policies and directives are in place.



Table 7. An analysis of Policies related to UPA

SL- No.	Name and year	Area of work	Extent of jurisdiction	Character	Relation to UPA	Type and status
1.	Andhra Pradesh Water, Land and Trees Act, 2002	Water, land and tree	State of Andhra Pradesh	Regulatory	Encourages rain water harvesting and recharge to improve ground water. Encourages better quality of water, encourages plantation of trees including horticultural ones and landscaping	Act (legal)
2.	Hyderabad Municipal Corporation Act 1955 Amendment 1996 through ordinance No.17 of 1996 also called Stray Cattle Ordinance	Dairy farms and straying Cattle in public places	Hyderabad Municipal Corporation (Hyderabad and Secunderabad)	Regulatory & prohibitive	Dairy farms and livestock should be kept away from human dwellings (not within 200 meters) in a separate premises with necessary facilities (sufficient open spaces and number of cattle restricted as per the floor space) without causing any nuisance and danger to human life or environment. Prohibits the straying of animals including cattle and buffalo. Importation of cattle for human food into the twin cities without permission is prohibited. Permission required to run a dairy farm through issue of license a license. Fines ranging from 300 Rs to 1000 Rs (6.5 - 22 US\$) for the 1st to 3rd offence, respectively.	Act (legal)
3.	Municipal Solid Wastes (Management and Handling) Rules, 2000	Municipal Solid Waste	(frame work prepared by Central) adopted by States and Union Territories) state and urban (City, town, municipal corporation, Municipality)	Regulatory	Littering of MSW is prohibited in urban areas notified by state government. Waste shall be collected by the municipal authorities. Biodegradable wastes and waste from animal will be managed to make use of them by processing them through composting vermicomposting and anaerobic digestion or any other biological process for stabilization of the same. Segregation of waste will be encouraged in civil society.	Act (legal)
4.	Agriculture Policy: Vision 2020 (IARI)	Agriculture development	National	Visionary	Encourages the addition of livestock in urban area such as Cattle and/ or Buffalo	Advisory
5.	City Development Strategy - Hyderabad, 2004	Achieving equitable growth, addressing poverty, issues of municipal service delivery, community empowerment and decentralized decision making	Hyderabad Metropolitan region	Visionary	Expresses that the land use pattern is showing decline or stagnation of green cover, open spaces, water bodies and agricultural use which have favorable impact on environment and stresses a need to develop land use pattern as per the standards and norms prescribed. It stresses the need for developing the database, increasing the availability of land, better inter institutional coordination and, public participation for this purpose.	Advisory

Table 7. An analysis of Policies related to UPA (Con...)

Sl.-No.	Name and year	Area of work	Extent of jurisdiction	Character	Relation to UPA	Type and status
6.	Fifth and Final Report -Oct 4 2006 Revised Draft National Policy For Farmers	Farmers welfare through integrated approach of NRM, technology and policies	National	Welfare	"Urban home gardens could make a substantial contribution to improving nutrition security through the cultivation and consumption of vegetables and fruits. Home nutrition gardens could be designed for low income groups in such a manner as to provide horticultural remedies to major nutritional maladies. Support services in the form of good seeds and planting material and safe plant protection techniques will be needed. Urban slums need particular attention from the point of view of combating malnutrition through nutrition gardens"	Advisory





6. 0 Constraints and Opportunities for UPA in Serilingampally

Perceived Constraints to UPA in Serilingampally

- ❖ Lack of understanding on forms, dimensions and location of UPA
- ❖ Lack of knowledge and information on existence of UPA
- ❖ Lack of awareness on the potentials of UPA
- ❖ Lack of available land
- ❖ Poor quality of soil
- ❖ Climatic constraints
- ❖ Lack of available water resources
- ❖ Lack of ample time to undertake activities other than routine work
- ❖ Lack of programs promoting UPA activities
- ❖ Lack of policies that promote and support the inclusion of UPA in municipal action plans
- ❖ Lack of Information Education and Communication (IEC) materials and a accessible training centre to support urban farmers
- ❖ Lack of extension workers to support urban farmers

- ❖ Lack of skills and ample knowledge in interested individuals/ groups
- ❖ Lack of cultural and traditional background on home gardening
- ❖ No institutional home for UPA

Opportunities and potentials for UPA in Serilingampally

- ❖ Inherent 'food insecurity' and high and increasing market demand for perishable vegetables
- ❖ Low space options including vertical and aerial cultivation methods, terraces/ balconies gardens
- ❖ home gardens in low income communities for food and income security
- ❖ school and institutional gardens
- ❖ edible landscaping
- ❖ hydroponics and organoponics
- ❖ Rainwater harvesting, grey water re-use, treated wastewater re-use (*following appropriate crop selection risk health and environmental risk mitigation measures*)
- ❖ Composting of municipal solid waste

Further, it is envisaged that the promotion of UPA in Serilingampally will act as a catalyst for small and medium enterprises associated with nurseries (vegetables, ornamentals, medicinal and fruit trees), composting and the local manufacturing of low space and vertical cultivation structures.

Creating an equitable and mutually acceptable policy environment for UPA

Multi-stakeholder processes are increasingly considered an essential element of policy design, development and implementation. It is considered to be critical that people and organizations from a diversity of backgrounds work together in order to achieve sustainable and equitable solutions to the current challenges associated with urban development and the realization of a 'Sustainable City'.

It is envisaged that an equitable and mutually acceptable policy environment for UPA through the multi-stakeholder development of appropriate supportive policies and institutional and financial support mechanisms would pave the way for a sustainable and 'food and nutritionally secure Serilingampally'.

6.1 Home gardens for nutritional security, reduced expenditure and income generation:

Serilingampally has 59 Slums of which 44 are un-notified and 15, notified. The population of the 15 notified slums was 19,539 within 2,918 households out of which 2,283 households were below poverty line (BPL) (APUSP Household Survey, 2003).

In 2001, the slum population of Serilingampally accounted for 39.8% of the municipal population (151,101 persons in 2001). In addition in 2003, 45,000 persons (29.78% of total 2001 Census Population) in Serilingampally were considered as BPL. This sector of the Serilingampally society falls within the target group of the RUAFF-CFF project namely, the 'urban poor'.

Case Study of Surabhi Colony

The residents in Surabhi colony originate from Surabhi village near Kaddapuh District, Andhra Pradesh and are primarily traditional folk theater artists. Due to the declining interest in traditional folk theatre, particularly in urban areas such as Hyderabad the community faced an impeding financial crisis. To support the declining economic situation the Government of Andhra Pradesh provided them with land registration documents and established Surabi Colony. In June 2007 through multi-stakeholder discussions with, Serilingampally Circle and APUSP Project staff and IWMI, Surabi Colony was identified as having a high potential for the implementation of Home Gardens. Consequently, in June 2007, meetings were initiated with community residents and a socio-economic survey of 70 households (HHs) undertaken under the RUAFF-CFF Project.

Physical characteristics and population:

- ✧ Area of 4.5 hectares consisting of 200 plots of which 80 are occupied. The colony has a resident population of over 300.
- ✧ 60% of the houses were purchased under the Housing Development Cooperation (HUDCO) Bank loan scheme. Of the remainder, 25% are rented and 15% leased.
- ✧ Basal area of each plot is approximately 40m²

Gender and Educational Status:

- ✧ 48% of respondents were female and 52% male. Head of household was recorded as 70% female and 30% male.
- ✧ Education status similar between men and women with 8/11% (Male/Female) un-educated, 13/11% Class 1-5, 22/19% Class 6-10, 5/8% Intermediate and 5/2% graduates.

Existing home gardens:

- ✧ Of the 70 HHs surveyed, 57 had an existing home garden of which over 60% are mixed vegetable/ fruit/ flower production

- ❖ Of the existing vegetable gardens, 72% are managed by female members of the HH, 13% by men and the remaining 15% by a combination of HH members.
- ❖ 15 HHs reared chickens for self consumption

Economic status:

- ❖ 61% of HHs earned less than 4,000 INR per month, 22.4 % greater than 4000 but less than 10,000 INR and 16.6% greater than 10,000 INR per month.
- ❖ For the majority of HHs (those with monthly income less than 4,000 INR) vegetable and fruit account for 14% of monthly income. Protein in the form of eggs, fish and meat accounts for a further 17% of monthly income.

Constraints for home gardens:

- ❖ Water Supply: Drinking and domestic water supply in the colony is via bore wells and is limited.
- ❖ Available income to purchase fertilizer inputs limited
- ❖ Knowledge and training in vegetable cultivation limited
- ❖ Limited space for cultivation
- ❖ Poor quality of soil
- ❖ Awareness on the source of obtaining seeds and plants and other is poor
- ❖ Knowledge on pest and diseases management and plant nutrition is poor

Opportunities for home gardens:

- ❖ 100% of HHs dispose of garbage including kitchen waste in drains: Composting of kitchen waste and crop residues is a viable option.
- ❖ Use of low space cultivation techniques including vertical and aerial cultivation methods a viable option
- ❖ Rainwater harvesting from roof area and optimum water use efficiency is essential.
- ❖ Strong commitment: Women from HHs willing to participate in training. Resident home garden committee

“Surabhi Haritha Sankalepam” formed.

In collaboration with the Vegetable Department, Acharya N.G. Ranga Agricultural University, a comprehensive training programme was initiated on 1st November 2007 to residents in the following key activities namely,

- 1 Nursery bed preparation & management
- 2 Field preparation
- 3 Cropping calendars, inter-cropping and crop rotations
- 4 Plant Protection with emphasis on Integrated Pest Management (IPM)
- 5 Rainwater harvesting and water use efficiency
- 6 Composting of crop residues and bio-degradable kitchen waste
- 7 Use of both organic and chemical fertilizers
- 8 Harvest and post harvest storage

6.2 School Gardens

Serilingampally has 48 Government Schools out of which 4 are high schools, 11 are upper primary schools and 33 are primary schools. The majority of low income household send their children to these government schools. Opportunities exist for the establishment of ‘School Nutrition Gardens’ as linked to the Government Midday Meal Program. Serilingampally Municipality has a total of 48 Government schools out of which 4 are high schools, 11 are upper primary schools and 33 are primary schools. The majority of low income households send their children to these government schools.

Child malnutrition in low income groups is high in Andhra Pradesh (and India as a whole). As a result the Indian Government runs a midday meal program to supplement child nutrition. By growing nutritious fruits and leafy vegetables in a School Kitchen Garden child nutrition can be addressed/ supplemented. The School Garden can also act as a tool for children’s education and behavioral change, which can also lead to better practice adoption back home

and help achieve the holistic nutrition well being of the household.

As per the MDGs 1 and 2 the key to development of children and their future livelihood is adequate nutrition and education. However, the reality facing millions of children is that these goals are far from being met. Though in India, to an extent food security is ensured, nutritional security is still jeopardized. According to FAO, schools can make an important contribution to the countries efforts to overcome hunger and malnutrition and that school gardens can help improve the nutrition and education of children and families in both rural and urban areas.

Case Study on Andha Pradesh (AP) Social Welfare Residential School

Andhra Pradesh Social Welfare Residential High School and Jr. College for Girls is located in Goulidoddi Village, Serilingampally Circle, GHMC, Hyderabad. The school falls under the Ministry of Social Welfare and caters primarily for BC and SC pupils who's parents are BPL. The school has over 800 female students (aged 10 - 16yrs) who mainly originate from Rangareddy District. The pupils are resident for 10 months of each year. In addition, the school has 20 teaching Staff and 5 non teaching staff of which 50% stay in the campus.

To meet the nutritional needs of both the pupils and staff, the school has an in-house kitchen facility that provides three meals per day. On average, approximately, 80 kg of vegetables are consumed per day. This corresponds to less than 0.1 kg per person per day.

The National Institute of Health (NIH, 2005), recommends a 'fresh' vegetable intake of approximately 0.3 kg per day (In three 0.1 kg portions). At an international level FAO/WHO recommend an annual intake of 72 kg of fresh vegetables/ fruit per person per year. At 0.1 kg per person per day this corresponds to only 36.5 kg per person per year which is 50% lower than the FAO/ WHO recommended intake. Further, NIN (2005), emphasizes the

consumption of vegetables (such as green leafy vegetables) high in Iron (Fe) and vitamin A. In Andhra Pradesh, over 70% of children between the ages of 5 – 16 years suffer from anaemia. This is higher (80%) in girls who have reached puberty.

It is likely (*further detailed studies are recommended*) that the daily intake of vegetables is therefore inadequate to meet the nutritional needs of the pupils and staff. This may be directly impacting on the cognitive ability of pupils.

The school principal, Ms. P. Chudamani is very keen to improve the nutritional status of her pupils and staff. As a result, Ms. P. Chudamani has pledged her support and that of her staff and pupils for the establishment of a school kitchen garden. A multi-stakeholder consultative process was therefore established between IWMI, the Municipality, the School and the Vegetable Department, of Acharya N.G. Ranga Agricultural University, Hyderabad. This process was undertaken to develop a 'Pilot Project' that would be submitted for co-funding under the RUAFF-CFF Project. As a result a 1 acre plot of land has demarcated for the intensive production of to grow vegetables. Water supply for irrigation will be sourced from the conjunctive use of bore water and harvested rainwater. Emphasis will be placed on optimizing water use efficiency and where appropriate, micro-irrigation techniques.

In collaboration with the Vegetable Department, Acharya N.G. Ranga Agricultural University, a comprehensive training programme was initiated (date) to train teachers and pupils in the following key activities namely,

- 1 Nursery bed preparation & management
- 2 Field preparation
- 3 Cropping calendars, inter-cropping and crop rotations
- 4 Plant Protection with emphasis on Integrated Pest Management (IPM)
- 5 Irrigation
- 6 Composting of crop residues and bio-degradable kitchen waste
- 7 Use of organic and chemical fertilizers
- 8 Harvest and post harvest storage

