



The three main UPA activities in Hyderabad are, fodder and vegetable production, urban forestry and dairy/milk production.

Introduction

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

derabad recorded a population of 6 million in 2001 showing a 17.2 % increase as compared to 1991 making it one of the fastest growing urban areas in India (Handbook of Statistics of Ranga Reddy, 2001:157). The population projections for 2011 for the twin cities range from 9.5 to 11.3 million people (HUDA Draft Master Plan for 2011). With such a rapid increase in urban population a concomitant rise in urban

poverty and decline in the quality of the urban environment are of growing concern to the city authorities. In this context, Urban, Peri-urban Agriculture [UPA] assumes an important role as a source of livelihood for the urban poor.

The various functions of UPA include

- The provision of livelihood, income and food security to urban migrants and other urban poor whose primary skills are in agronomy
- Supports a 'chain of economic beneficiaries' and contributes to the local economy
- Optimization of urban and peri-urban land use
- 'Carbon sink' for the management of urban CO₂ levels
- Provision of recreational areas
- A teaching tool for primary through to tertiary education programs

1. Fodder and vegetable production with wastewater irrigation

Research undertaken in India by IWMI [International Water Management Institute] in collaboration with project partners has shown that wastewater irrigation in UPA is common, but with major undocumented and poorly understood tradeoffs. On the one hand, wastewater irrigation benefits poor communities through employment, income, savings in fertilizer costs, increased reliability of irrigation timing, and access to water. In addition, because of the prox-

imity to urban markets, it allows farmers (the landed and those who lease land) to grow perishable, but high-value crops. Conversely, there are economic and health-related risks for those directly using the water such as members of farming households (women, men and children who spend time in the fields) and field laborers (permanent, seasonal and migrant laborers) (Buechler, 2004; Ensink, 2004).

In the city of Hyderabad access to 'clean' water for irrigation is

problematic due to the predominance of hardrock aquifers which, are subject to rapid drawdown. In Hyderabad, about 600 million liters per day of wastewater enters the Musi River which is subsequently used for irrigating para grass (used as a fodder grass), leafy vegetables and paddy along the 'Musi River Corridor'.



According to the Landsat image February 2005, about 2,108 ha para grass in and around Hyderabad and 10,000 ha of paddy along the 'Musi River Corridor' are irrigated with wastewater.

This wastewater is a mix of sewage from the residential areas of the city, untreated illegally dumped industrial effluents, municipal storm water runoff, and rain water with little or no inflow from upstream of Hyderabad.

Preliminary studies conducted by IWMI show that there is a very small area under wastewater irrigated peri-urban vegetable production mainly by women farmers. However, fodder and vegetable production contributes significantly to livelihoods and food security of resource-poor urban and peri-urban women and men. In and around Hyderabad, women constitute the majority of both vegetable producers (they rent the land) and vendors. Women tend the buffaloes and men harvest or purchase the fodder. Livestock rearing is on the rise in these

regions (Buechler and Devi, 2003b). The use of wastewater in fodder and vegetable cropping systems has been shown to be beneficial for farmers as a result of the reliability and fertilizer value of wastewater that may result in considerable savings in inputs translating into higher incomes. Furthermore, there is a chain of beneficiaries who depend indirectly on wastewater for their livelihoods (and who are usually not accounted for in the value attributed to wastewater such as landless laborers who work in agriculture or in animal husbandry (Buechler, 2004). In Hyderabad, it was found that households that produce vegetables saved 20% of their total food expenditures by retaining part of the produce for household consumption (Buechler and Devi, 2003c). Further, Para grass production and sale contributes an estimated annual income of US\$ 4.5 Million or Rs 202 Million to the local economy of Hyderabad (IRDAS, 2005).

An important additional benefit of the wastewater is its fertilizer

value that results in considerable savings in inputs translating into higher incomes for farming households. Near Hyderabad, fertilizer prices rose by Rs. 50 per bag or 20% between March 2002 and March 2004. No fertilizer is applied by wastewater farmers to their leafy vegetables; fertilizer (urea) is applied only in the winter months to the fodder fields.

Demand for vegetables is rising in India due mainly to its rapidly growing population, increasing incomes with corresponding increased capacity to invest in refrigeration and storage and increased health awareness (Times of India, May 2004; Tribune of India, 2001) as well as increased exports of vegetables (www.tifac.org.in). In India, vegetable production rose from 56.7 million tons (MT) in 1996 to 78.0 MT in 2001 (FAOSTAT, 2004). In Andhra Pradesh state, the growth rate in production from 1997 to 2003 was 31.1%. Rangareddy is one of four leading districts in the state in vegetable production.



2. Urban Forestry

Parks and Forestry in urban areas are often considered to be the lungs of the city and are also utilized for recreation and as 'Carbon sinks' for CO₂. Hyderabad Urban Development Authority [HUDA] has done exemplary work on urban forestry in Hyderabad under the Green Hyderabad Environment Programme [GHEP]. The main aim of this programme is to "Achieve sustainable improvement of the living environment with active stakeholder participation and a focus on gender and poverty alleviation." The principle components of this programme are

- a. Urban Greening – To increase the green cover to over 13400 ha in the Hyderabad Development Area [HDA]
 - b. Lake treatment and conservation – To effectively conserve, treat and manage 87 lakes in the HDA in a sustainable manner
- Creation of nutritive fodder banks in degraded wastelands with top feed fodder trees.
 - Silviculture plantations: Qualitative improvement in pasture and tree species has been undertaken with a combination of palatable grasses and legumes by adding highly nutritive fodder species like *Stylosanthes hamata*, *Sehima nurvosum* and other fodder tree species like *Ficus religiosa*, *Albizia lebeck*, *Albizia odoratissima*.

The main activities that have been carried out to date include;

- Afforestation of degraded Wastelands: 5,000 ha of wasteland has been effectively brought under tree cover by planting 51.50 lakh seedlings of indigenous species.



- City forests on institutionally owned lands
- Homestead planting
- Greening Residential Colonies: HUDA provides the Residential Welfare Association (RWA) with a free sapling and tree-guard at subsidized rates. Subsequently, an agreement is reached between HUDA and the RWA for irrigating and maintenance of plants.
- Greenbelts along roadways

As directly related to the HUDA GHEP, programme has contributed significantly to the training and empowerment of women's groups in Hyderabad. Poor women from slums and those whose economic status puts them below the poverty line are given training in 'plant nursery raising' annually at six central plant nurseries covering city and its peri-urban areas. In addition, and of fundamental importance to the programs success, HUDA ensures buy-back of the seedlings produced. Normally each beneficiary would get about Rs. 550/- to Rs. 600/- per month. Over the past 5 years, over 550 women groups were formed involving over 6000 women. The trained women have raised about 87 lakh seedlings for planting in the project sites and

for distribution to local bodies and the general public. To date, approximately Rs. 19.2 million has been distributed to the women who were involved in this programme. The women groups are also taking up cultivation of leafy vegetables in between the planting rows. The earning by sale of these leafy vegetables on every alternate day is Rs. 200/- per group.

Further, HUDA has created 4 million man days of direct employment for the urban poor under the GHEP programme of which nearly 70% was for women. Apart from direct employment, utilisable resources namely, fodder, fuel wood and broom grass was created under the programme which improved the social status and economic condition of those involved.

The Municipal Corporation of Hyderabad [MCH] has also undertaken extensive work on urban forestry with a primary focus on the development of parks. In this regard MCH has undertaken rejuvenation and development activities in Indira, Chacha Nehru, Jalagam Vengala Rao, and Imliban Parks. In addition, thirteen other major parks have been identified for development.

There are 709 Colony parks/open spaces within the



area covered by MCH. Of these, over 471 (66%) have been developed into forest with the remaining 238 (34%) set aside for use as colony parks.

Further, MCH has also coordinated the development of fifteen Theme Parks with the intention of creating awareness among citizens with respect to different plant species and to encourage academic interest among students, botanists, ecologists and other interested persons. In addition to above mentioned activities, MCH had by the end of August, 2000 planted over 4.5 lakhs plants. These plants were planted mostly in avenues, green belts, open spaces, grave yards, around water bodies and in institutional lands. These activities are on-going.



3. Dairy / Milk production

India ranks first in world milk production (Ramnath, 2002). Moreover, the annual rate of growth in milk production in India is between 5-6 per cent, compared to 1 per cent globally. The steep rise in the growth pattern has been attributed to a sustained expansion in domestic demand (India Dairy, 2003). Andhra Pradesh where Hyderabad is located has seen some dramatic increase in milk pro-

duction over the last two decades, based primarily on buffaloes. There was a 7.9% increase in the population of female buffaloes in 1999 as compared to 1993 (Directorate of Economics and Statistics, Andhra Pradesh, 2001). The milk production of Andhra Pradesh in 1991-92 was 2.9 MT increasing to 4.9 MT by 2003 (NDDB, 2003).

Less than 20% of the milk is produced by industry in India.

The remaining 80% is either for household consumption or is marketed through informal channels (Staal, 2001). In Hyderabad, with the rapidly expanding urban population combined with urban consumers' increased purchasing power, it is inevitable that milk production and consumption are also rising rapidly.

Milk is an important dietary requirement for children and



young people and plays an important role in the Indian cuisine. Some preliminary estimates by IRDAS reveal that, of the 1.8 million litres per day of milk consumed by the Hyderabad city dwellers, 100,000 litres per day are supplied by private vendors within HUDA area.

In dairy producer households, 25% of the milk produced (assuming a household of 6 members owns one buffalo) is retained for household consumption and 75% is sold. Dairy producers' livestock also serves as a security asset in times of need (Buechler and Devi, 2003d).

However, very little information is available on the number of milk cattle that are kept within the HUDA area, the number of families dependent on them for their livelihoods and the municipal regulations that affect them.



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

The RUAF-Cities Farming for the Future project (RUAF-CFF) is a global initiative that aims to "contribute to urban poverty reduction, urban food security, improved urban environmental management, empowerment of urban farmers and participatory city governance by capacity development of local stakeholders in urban agriculture and facilitating participation in multi-stakeholder policy formation and action planning on urban agriculture, including safe reuse of urban organic wastes". IWMI is the regional coordinator of the RUAF-CFF South and South-east Asia Region.

The fundamental basis of the RUAF-CFF project is a Multi-stakeholder Process for Action Planning and Policy Design (MPAP). In Hyderabad, it is

envisaged that the MPAP process will involve the following activities

The collection and interpretation of data and documents pertaining to various UPA activities.

An evaluation of current legislative and institutional frameworks under which UPA operates.

Identification of the key constraints/opportunities to sustainable and economically viable UPA in Hyderabad.

Gender and social equity mainstreaming.

Formulation of a policy document that will be presented and discussed/revised at a series of Multi-Stakeholder Forums to facilitate an equitable and mutually acceptable policy environment for UPA.

Formation of a series of action plans that will address key constraints/opportunities to sustainable and economically viable UPA in Hyderabad.

Initiation of a co-funded Pilot Project as identified during the action planning process.

Development of selected action plans into full proposal documents for possible submission to international donors for co-funding support.

In addition, the RUAF-CFF project will establish a Regional Advisory Panel on UPA and in 2005 undertake a Regional MPAP Training workshop and Regional Gender Workshop.



References:

- Buechler, S. 2004. A Sustainable Livelihoods Approach for Action Research on Wastewater Use in Agriculture in Christopher Scott, Naser Faruqui and Liqa Raschid-Sally (eds.) *Wastewater Use in Irrigated Agriculture: Confronting the Livelihood and Environmental Realities*. CAB International.
- Buechler, S. and G. Devi. 2003b. *Farmer Innovations among Groundwater Users in Wastewater Irrigated Areas near Hyderabad, India*. Proceedings of the 8th International Conference on Water Conservation and Reuse of Wastewater. Indian Water Works Association.
- Buechler, S. and G. Devi. 2003c. *Household Food Security and Wastewater-dependent Livelihood Activities Along the Musi River in Andhra Pradesh, India*. Report submitted to the World Health Organization (WHO), Geneva, Switzerland.
- Buechler, S. and G. Devi. 2003d. *Wastewater as a Source of Multiple Livelihoods? A Study of a Rural Area near Hyderabad City, Andhra Pradesh, India* in Rema Devi and Naved Ahsan (eds.). *Water and Wastewater: Developing Country Perspectives*. London, U.K.: International Water Association.
- Ensink J.H.J. 2004. *Wastewater irrigation in India; Spatial variations in water quality and its impact on farmer's health*. Unpublished document, London School of Hygiene and Tropical Medicine, London, United Kingdom. www.indiadairy.com. Accessed March, 2004.
- National Dairy Development Board, India. www.nddb.org. Accessed February 2, 2004.
- Ramnath, N. 2002. *Indian Dairy Study Opportunities in the Indian Dairy Industry*. Special Report. February. Rabobank International, Food and Agribusiness Research.
- Reddy, Ratna V. 2001. *User Valuation of Renewable Natural Resources: The User Perspective*, New York, USA: Nova Science Publishers, Inc.
- Scott, C., N. Faruqui and L. Rachid-Sally (eds.) 2004. *Wastewater Use in Irrigated Agriculture: Confronting the Livelihood and Environmental Realities*. Wallingford, Oxfordshire, U.K.: CAB International.

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