Analysis and Action for Sustainable Development of Hyderabad

Hyderabad as a Megacity of Tomorrow: Sustainable Urban Food and Health Security and Environmental Resource Management

Project funded by Federal Ministry of Education and Research (BMBF), Germany:
"Research for the Sustainable Development of the Megacities of Tomorrow"

FOOD AND NUTRITION IN HYDERABAD

Current Knowledge and Priorities for Action in an Urban Setting

NATALIA SMITH, JAMES GARRETT AND VISHNU VARDHAN

Research Report 1

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Research Reports are outcomes of the Pilot Projects implemented jointly in Hyderabad by the Pilot Project Groups of the Megacity Project of Hyderabad. These reports for analysis and action focus on *knowledge generation and application* as well as on *institutions and governance structures* concerning the core issues of poverty, food, nutrition, health, transport, environment and resource degradation. This has been possible through joint research efforts, involving institutions of urban governance, integration of organisations of civil society in communication, participation, co-operation and network linking. Views and opinions expressed in the reports do not necessarily represent those of the Project Consortium.

Food and Nutrition in Hyderabad

Current Knowledge and Priorities for Action in an Urban Setting

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Research Report 1

April 2007

Abstract
This report provides an overview of the food and nutrition security situation in the city of Hyderabad. The empirical evidence reviewed in this paper was collected primarily through: (i) electronic bibliographic searches, (ii) informational meetings with key actors in Hyderabad, (iii) data from the second National Family Health Survey (NFHS-2) completed in 1998/9, and (iv) qualitative and quantitative studies conducted in selected communities in Hyderabad. The review presents a conceptual model of food and nutrition security that it then uses to frame an exploration of the conditions and causes of food insecurity and malnutrition in Hyderabad. The report also describes food and nutrition programs operating in Hyderabad. It concludes by highlighting knowledge gaps that need to be filled in order to inform policies and programs to reduce food and nutrition insecurity in Hyderabad.

Key findings include:

- Research on food and nutrition in Hyderabad is exceptionally limited. Studies carried out under this project were among the few in the past decade to measure levels of malnutrition. They also added substantially to the literature on marketing systems, food consumption patterns, and child feeding and care practices in Hyderabad.
- Levels of malnutrition in urban slums rival that of rural areas. In the study areas, about 15 to 20 percent of children 6 to 36 months old suffered from acute malnutrition. Chronic

- malnutrition was more varied: in one area, stunting was 13 percent, and in another it was 42 percent. The reasons for such variation are unclear, but most likely relate to social and geographical factors, such as ethnicity, caste, or length of residence.
- Both under- and over- nutrition exist among the population. Under nutrition and micronutrient deficiencies are widespread among low-income groups. Overweight is not yet a widespread problem, but it is seen among high-income groups. This is expected to become more of a problem with significant economic growth, so Hyderabad cannot afford to ignore the problem. Ensuring diet quality for all income groups is a priority.
- Child feeding and caring practices in Hyderabad are not optimal. Even though breastfeeding is the norm, problematic practices are widespread including discarding of colostrum, providing liquids to young infants, and starting solids before the child reaches 6 months of age.
- Through its contribution to disease, lack of adequate water and sanitation appears to be a major contributor to malnutrition. Child diseases, such as diarrhoea and acute respiratory infections, are widespread in the urban slums with prevalence rates similar to rural areas of Andhra Pradesh.
- Provision of infrastructure is not consistent across low-income areas. Newer communities suffer from bureaucratic rules making it difficult for them to demand adequate basic services. Most households in the study areas had a water supply system, but the water was not always available. Latrines or toilets were available for adults, but children defecated in the open. Sewage systems were available, but they often overflowed into houses during the rainy season.
- Economic growth is changing food and production patterns. These changes and public regulations are affecting the livelihoods of street vendors and of those who run the small neighbourhood stores, where many poor people buy their food. How economic, or social and political, changes are affecting how and where the poor buy their food, and what they buy, is little studied, despite its implications for their food security and their nutritional status, as well as for the livelihoods of all those who participate in the food and agricultural system that feeds Hyderabad.
- As the city expands, it also affects the surrounding environment and economy. The promotion of farmers' markets, called Rythu bazaars, is one way that Hyderabad is actually bringing urban and rural, consumers and producers, closer together, to the benefit of both.

- Political commitment, coordination and action across levels of government need to be strengthened. Currently, actions affecting the main determinants of nutrition—food, health, and care—are not coordinated across actors, with the result that the appropriate policies and programs are not effectively directed to the same place at the same time. It is imperative to understand the interplay of factors at the community, household and individual levels; to empower actors, especially the poor, to demand response but also assume responsibility; and to reflect on what needs to change at the governmental and institutional levels to effectively improve the food and nutrition security situation of Hyderabad, and on how to accomplish that.

KEY WORDS: nutrition, food security, urban, Hyderabad

Acknowledgements

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The use of the libraries at NIN, the Administrative Staff College of India (ASCI), Acharya N G Ranga Agricultural University, and the Centre for Economic and Social Studies (CESS) is gratefully acknowledged. We express our appreciation to Dr. Veena Shatrugna of NIN and Dr. Christoph Dittrich of the Institute of Cultural Geography, Freiburg University, for their comments on an earlier draft of this paper. Particular thanks are due to Dr. Shahnaz Vazir, Dr. Subba Rao GM, and Dr. K.R. Chowdry for their constant support. We also thank Dr. Ramesh Chennamaneni of Humboldt University for his overall guidance. We are grateful to the German Federal Ministry of Education and Research (BMBF) for funding of this study, through Humboldt University, as part of the “Sustainable Development of the Mega-Cities of Tomorrow” Project.

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1 Introduction and Research Objectives

Urban households, just like their rural counterparts, can be highly vulnerable to hunger and malnutrition. And, just as in rural areas, various factors underlie this vulnerability. The relative importance of these factors, however, can be quite different. Unlike many rural households, for example, urban households are immersed in a cash economy. They must earn an income to pay for their food. The jobs of the urban poor are unstable, and so their incomes are often uncertain. As in rural areas, food prices and incomes fluctuate with the seasons. Antiquated and inefficient food transport, storage, and marketing systems can make prices higher than they otherwise would be. Public food and nutrition interventions are frequently ineffective, inappropriate, or misdirected. Lack of coordination and alignment among these programs and among the different levels of government where they operate can also hamper their impact.

Incomes and food availability are important, but they are not the only factors that affect nutrition, especially for those at the ages of greatest vulnerability, from 0 to 2 years old. For these infants and small children, a safe and healthy environment, as well as maternal education and child feeding and caring behaviours, are critical. These behaviours are themselves often constrained by knowledge, income, or social norms. Traditional beliefs or the fact that women must work outside the home may discourage the most beneficial breastfeeding practices, for example.

Perhaps surprisingly, we also know that households, especially urban ones, can suffer from poor nutrition even as economic growth brings higher incomes and less food insecurity. Urban residents are more likely than rural residents to purchase foods from street vendors or from supermarkets, for example. As they consume higher amounts of processed foods, micronutrient deficiencies, rather than a lack of energy (calories), can emerge as the primary nutritional problem. These deficiencies can cause not only undernutrition among children but, in combination with excess energy consumption, can lead to overweight and nutrition-related chronic disease like diabetes among adults.

Currently, over half the population of Hyderabad is poor and more than 1.2 million Hyderabadis live in slums. Hyderabad is experiencing rapid growth that holds the potential for a better life for all. The urbanized core of the city is expanding, and clearly requires additional planning in infrastructure, including transport and power. But cities must also pay attention to social concerns, especially the development of human capital that is the building

block of greater economic and social development. If Hyderabad is to ensure that hunger and malnutrition do not grow along with its population, and that it deals effectively with the emerging threat of overweight and nutrition-related chronic diseases (NRCDs), it must take steps to understand the issues. It must devise innovative solutions that are effective in reaching diverse groups in a complex urban environment.

The German government, through the Ministry of Education and Research (BMBF) and its "Sustainable Development of the Megacities of Tomorrow" project, has recognized the need to respond to these challenges. The Megacities project recognizes that, globally, we have only limited information on challenges to social and economic development in megacities as well as appropriate program and policy responses. This is especially true with regard to urban hunger and malnutrition. We have years of experience in rural areas, but much less with cities. We have basic knowledge about "what works" to achieve nutrition and food security, but less knowledge about "how" that works, particularly given the complexity of livelihood systems, social networks, and governance in developing-country cities. Characteristics of megacities, including their diversity, size, and interactions with their surrounding physical environment, complicate these relationships even further. This research project will provide knowledge about conditions in Hyderabad and potential solutions to hunger and malnutrition there. It will also seek to promote action and improve policies and programs. With a focus on generating knowledge about problems and solutions, we also hope to provide knowledge that growing megacities around the world can use.

This review has provided essential background for preparation of the proposal for research in the coming years, as it has given us context and details of the reality of food and nutrition in Hyderabad. One of the first activities of the research project itself will be to fill some of the information gaps noted here, and to use this information to initiate dialogue with key decisionmakers and stakeholders and to begin raising awareness among them of food and nutrition issues and their importance to Hyderabad's sustainable development.

This review

- Surveys what is known about the current food and nutrition security situation of Hyderabad and
- Identifies future challenges and areas for action and study.

The following section, Section 2, describes the conceptual framework used by this report to understand the processes and interactions that affect food and nutrition security; it also

provides evidence of why issues of nutrition and food security should matter to policymakers and civil society in Hyderabad. Section 3 describes the methodology undertaken to complete the literature review. Section 4 presents findings from the literature, as well as from primary data collected under this pilot project, on food and nutrition in Hyderabad. The section has two broad sub-sections – levels and determinants of nutrition and food security, and policies and programs. Section 5 identifies future challenges and proposes areas for study and action.

2 Conceptual Framework and Nutrition and Food Security for Development

This paper examines the conditions, determinants, and context of the food and nutrition security situation in Hyderabad during the past 20 years. The conceptual framework used (Figure 1) presents nutrition and food security as outcomes of complex and interrelated processes affecting food, health, and care at societal, community, household, and individual levels.

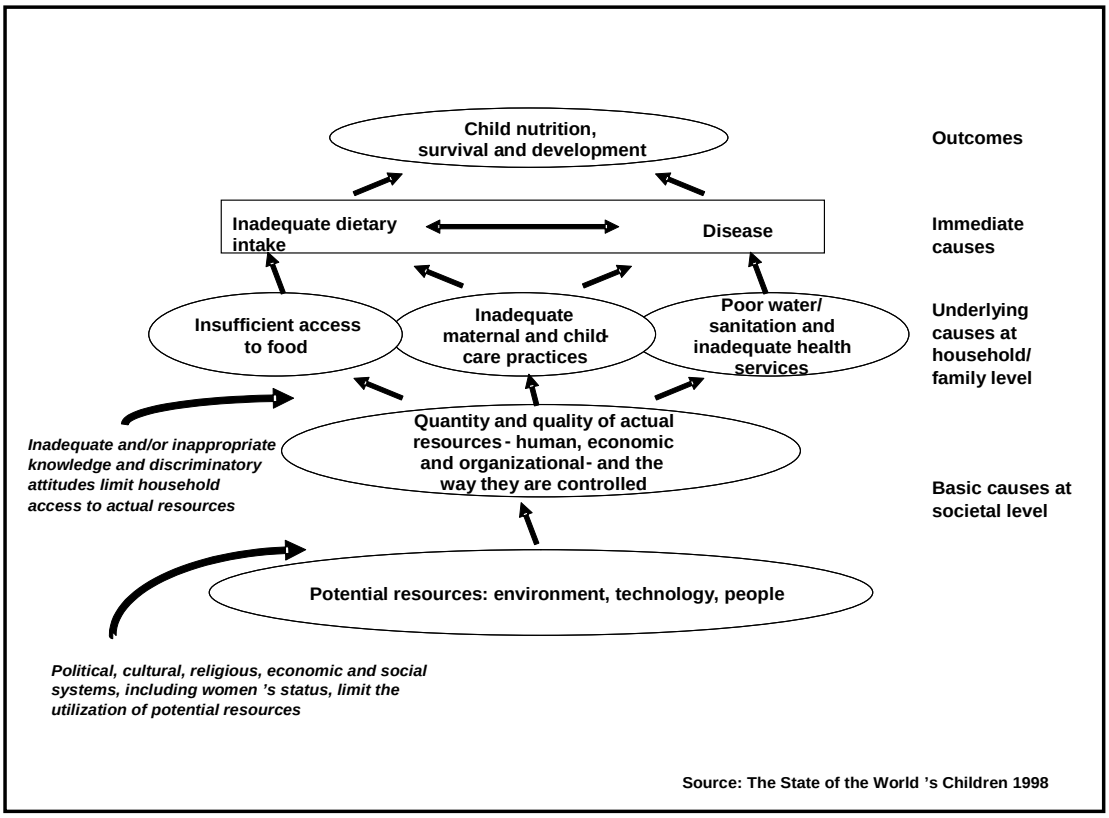

Figure 1: Child nutrition and food security: A conceptual framework

Food security is achieved when individuals have "physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" (FAO 2002). For a household to be food secure, food must be available at the level of the household and community (i.e., own-production and markets) and households must be able to access or acquire it (through purchases, given prices and incomes; or transfers from others, including social programs).

This paper takes a holistic approach to food and nutrition security. In the conceptual framework, nutrition and food security are centred within a multifaceted convergence of causal factors in which food, care, and health (including access to quality health care and the household environment) make direct and important contributions to nutritional status. Household-, community-, and social-level factors affect how these play out at the individual level. These factors are grouped into three categories: immediate, underlying, and basic causes.

At the individual level, nutritional status is affected by the synergistic relationship between the immediate determinants—dietary intake and health status. For an individual to have good nutrition the diet must be adequate in quantity and quality to provide the necessary combination of nutrients a body needs to function. On the other hand, during ill health intake of food is reduced and nutrient absorption is hampered, making the individual more prone to malnutrition. In developing countries, the two most prevalent nutrition-related health problems among children under 5 are diarrhoea and acute respiratory infections (ARI) (Klennert 2005).

The immediate determinants are in turn affected by underlying causes found at the household level. These are access to food, maternal and child care practices, water and sanitation, and health services. Access to food will be influenced by a household's resources, such as income and labour, and market prices. Care practices are an important component in this framework, and have gained substantial interest over the past few years. Care is defined as the attention and support provided by the household and community to ensure the healthy physical, mental, and social development of children (Smith et al. 2003). The quality and amount of food intake are affected by care practices, such as food preparation and storage, feeding practices such as breastfeeding and complementary feeding, and psychosocial interaction with the child. The hygienic environment in which the child grows up is another set of factors that can hamper nutritional status. Living in unsanitary conditions, not having proper toilet facilities, or not having access to an adequate quantity of water with adequate quality can increase the disease burden at a household and individual level. And lastly,

availability of and access to quality health services, can also affect nutritional status. Availability of prenatal care may reduce the incidence of low birth weight, and close proximity to health care facilities may increase child immunizations and early detection and treatment of malnutrition or disease.

All of these factors take place within a particular political, cultural, economic, and social environment. Consequently household-level factors are in turn influenced by basic causes at the societal level—economic structures and activities, formal and non-formal institutions, the social, political and ideological environment, and available natural resources. National policies can reduce malnutrition by providing resources and capabilities to create a more enabling environment that increases the impact of other actions. For example, providing basic health services or sanitation or promoting girls' education can bring about positive changes in the underlying causes—expanded availability of healthcare resources at the community level or heightened ability of women to provide optimal caring practices to their children. These in turn will be reflected in better nutrition levels among children and other household members.

2.1 Nutrition and food security: Implications for Hyderabad

So far we have talked about the causes of malnutrition and the important relationship that exists between nutrition and food security; but, why do policymakers, civil society, and the general public need to concern themselves with such issues? Why should nutrition and food security be an integral part of a development strategy for Hyderabad? It is now universally agreed that reducing levels of food insecurity and malnutrition is a moral obligation, which governments across the world should seek to achieve. Yet the argument for ensuring adequate food and nutrition goes beyond an ethical dimension; studies have shown that reducing hunger and attaining good nutritional status can have a large impact on a country's development process.

Good nutrition has important implications for economic growth and productivity. Lower disease incidence and better school attendance and performance improve skills, health, and cognitive abilities, and lead to increases in income and productivity. Babies of well-nourished mothers are more likely to complete the full gestational period and attain an appropriate weight at birth. If these children are well-nourished during the crucial first two years of life, they are more likely to perform well in school, postpone dropping out, and later on obtain a

higher paying job (World Bank 2006). When education and pursuing a career become higher priorities, marriage occurs at an older age. Women are then more likely to have fewer births but healthier babies, which are less likely to be affected by diet-related chronic diseases later in life (ACC/SCN 2002). This in turn improves living standards, economic performance, and the growth potential of a country.

Numerous studies have quantified the cost of hunger and malnutrition arising from reduced income-earning capacity as well as lower physical and cognitive abilities (World Bank 2006). The economic losses can be severe. In India, one study indicated that the productivity losses associated with undernutrition and micronutrient deficiencies could equal around $114 billion (the annual Gross Domestic Product [GDP] is around $800 billion) between 2003 and 2012 (AED 2003). Another study, also in India, estimated the productivity losses associated with reduced wage-employment due to child malnutrition to be $2.3 billion (Darnton-Hill et al. 2005). In Asia, Horton (1999) found that protein-energy malnutrition and reduced cognitive ability is associated with a productivity loss of between 2 and 10 percent of GDP.

It is crucial for decisionmakers and investors to understand what it means for a country or community to achieve food and nutrition security, and its essential role in effectively fuelling the development process. Recognition of this is evident in the Millennium Development Goals (MDGs), adopted in 2000 by member states of the United Nations to address the challenge of poverty reduction, in which improving nutrition in and of itself is a key target. The first goal aims to eradicate extreme poverty and hunger, and one of the indicators used to assess progress is prevalence of underweight among children under five (World Bank 2006). Yet, failure to reduce widespread malnutrition is apparent in the difficulty for many governments to meet not only the first MDG but others closely interrelated with nutrition, such as improved maternal and child health, education, and gender equity.

As shown in the conceptual framework, improving nutrition calls for a multisectoral approach. Sectors spanning from education and health to agriculture and markets need to work together to effect changes in nutrition, and not only because improving nutrition calls for changes across these sectors but also because, as shown above, good nutritional status of a population is essential for the ability of these sectors to reach their development goals. Improved nutrition is an important component in the development of human capital, and hence it is a good investment for governments and civil society alike. Improving the food and nutrition security of Hyderabadis will help the city follow a path towards sustainable development.

2.2 Is the city of Hyderabad giving enough attention to food and nutrition security?

The Hyderabad Urban Agglomeration (HUA), which includes the Municipal Corporation of Hyderabad (MCH) and the urban areas of 12 surrounding municipalities (see Figure 2), accounts for one-fourth of the urban population in the state of Andhra Pradesh and is ranked the sixth largest urban agglomeration in India (Ramachandraiah 2003). The population of HUA has undergone a dramatic increase in the past 10 years, growing from 4.3 million in 1991 to 5.75 million in 2001. Most of this growth is occurring in the surrounding municipalities of MCH; from 1991 to 2001 the population in these areas grew by 72 percent against 19 percent growth within MCH (MCH 2003). This has made HUA one of the fastest growing urban areas in India.

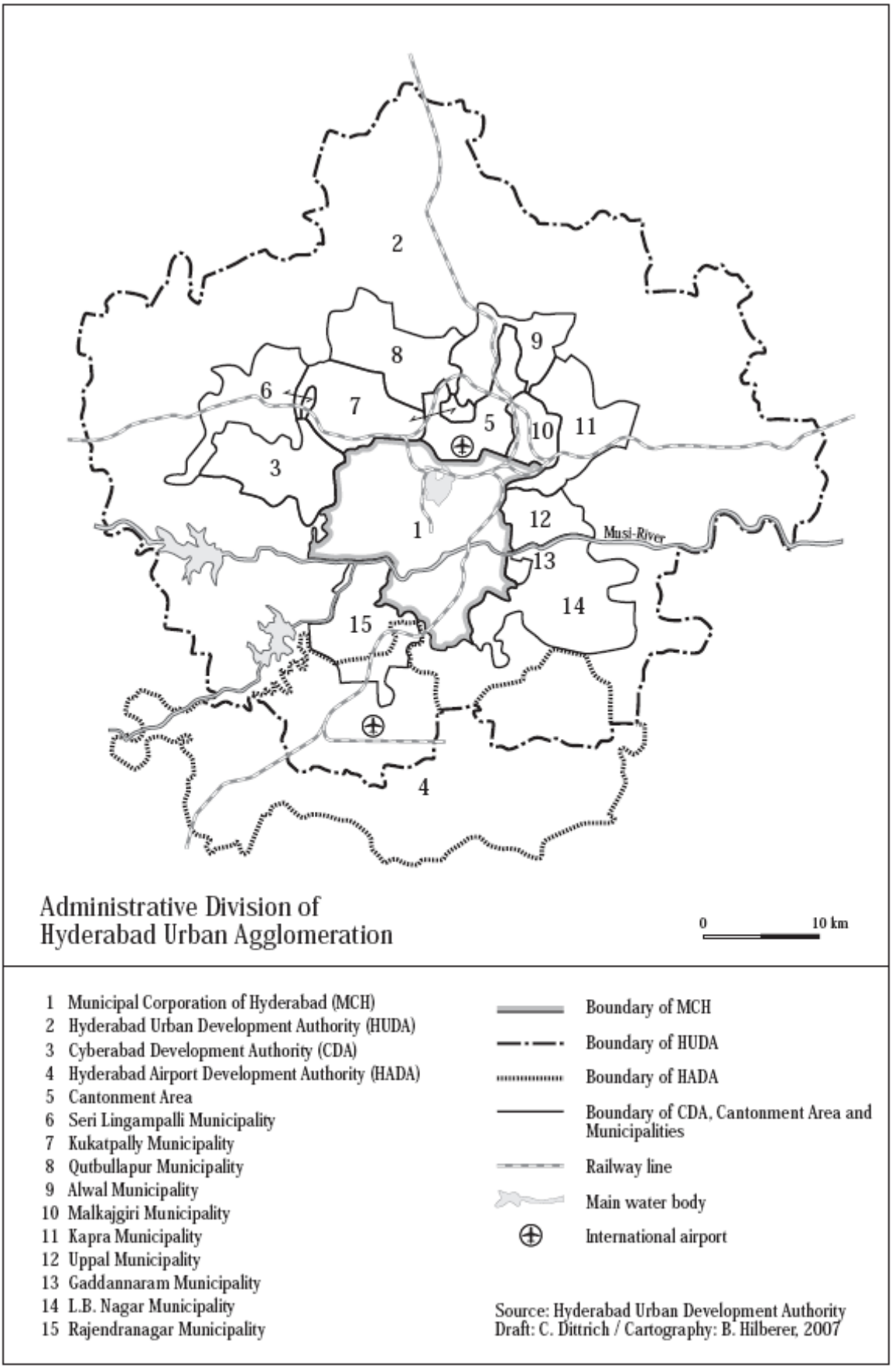

Figure 2: Map of Hyderabad Urban Agglomeration (HUA)

The city has established itself as a prime location for national and international information technology companies. An increase in job opportunities in the city and surrounding areas is one of the primary reasons for the expanding population. While rapid increases in investment have provided better economic opportunities for Hyderabadis, increases in population have also brought about developmental challenges to city dwellers and decisionmakers. Not only does the infrastructure and provision of basic services need to meet the growing demands of city dwellers, but awareness and effective implementation of social programs are also needed to ensure the health and productivity of its citizens— and thus the continued economic and social advancement of Hyderabad.

Table 1: Social and economic development indicators across Indian cities

		Hyderabad	**Mumbai**	**Delhi**	**Chennai**	**Kolkata**
Economic	Gross District Product Per Capita	Rs 23000	Rs 43000	Rs 39000	Rs 34000	Rs 33000
	Population below poverty line (2001)	23%	27%	8%	20%	6%
	Economic Disparity (% of low and lower middle-income households, 2002)	37%	27%	18%	42%	32%
Education	Literacy Rate (2001)	79%	87%	83%	80%	81%
	Drop out rate (2001)	66%	42%	52%	46%	42%
Housing	% of population living in slums (2001)	37%	55%	35%	40%	31%
Health	Child Mortality Rate (2001)	6.90%	NA	2.60%	3.70%	1.60%
Water	Piped water supply per day (Hours)	2	NA	2	1	NA
	Availability of potable water (liters per capita/day)	110	168	180	106	173
Water	Household water connections (2001)	36%	58%	51.30%	NA	23%
Sanitation	Sewerage Connections	41%	NA	55%	55%	NA
Transport	Average commute time (minutes)	60	30	45	NA	NA
	Public Transport Utilization rate	44%	NA	62%	36%	NA
	% Area covered by roads	6%	10%	18%	10%	12%
	Vehicles Density (passenger car units per KM of road length)	723	242	NA	293	NA

Source: Hyderabad City Development Plan (2003)

Yet the social indicators of the city show that population growth has not led to integrated economic and social development. As indicated in the City Development Plan (MCH 2003), 540,000 people, more than half a million, in Hyderabad are poor. Eighty percent of these live within the boundaries of MCH and the rest in the surrounding municipalities. Despite Hyderabad's better economic status in comparison with other states in India, its social indicators lag far behind. The City Development Plan underscores these gaps, pointing to low ratings in terms of literacy, school drop-out rates, and child mortality (see Table 1). In addition, there is a lack of statistics on food security and nutrition, suggesting that these important issues are not yet widespread concerns, despite their importance to human capital and economic and social development. The City Development Plan, for instance, says little about either, and has no food or nutritional indicator in its tables of social indicators.

This review is one of the first recent efforts to address these gaps, pulling together what information there is to provide at least an initial profile of food and nutrition in the city. The potential for widespread economic growth is large; but in order for the population of Hyderabad to take full advantage of it, it will be necessary for the city to develop a plan that explores and understands these shortcomings in order to create more sustainable, inclusive city development.

3 Methodology used to Access Relevant Literature and Information

The empirical evidence reviewed in this paper was collected primarily through two methods: (i) electronic bibliographic searches, and (ii) informational meetings with key actors in Hyderabad. In addition, we use data from the second National Family Health Survey (NFHS-2),[1] completed in 1998/9 and available through ORC Macro,[2] and from qualitative and quantitative studies conducted as part of the preparatory project activity.

The bibliographic search was performed using multiple electronic databases, including AGRICOLA, CAB Direct, Cassia, PubMed, Pais International, POPline, Sociological Abstracts, Web of Science, and Worldwide Political Science Abstracts. Grey literature was also included, using search engines such as Google, id21, and Eldis. The subject matter

[1] NFHS-3 was conducted in 2006, but the data are not yet public.

[2] Data were available for Hyderabad, but the sample size was too small for meaningful analysis. Urban Andhra Pradesh was used as a proxy.

covered in this literature review includes a wide range of materials, from food distribution and markets to nutritional status at the household level, and hence it was important to examine documents from a wide range of disciplines, including political science, anthropology, medicine, public health, and agricultural economics. The search took place from February to November 2006, and literature included does not date back more than 20 years.

The research team visited the city of Hyderabad for three weeks, from August 26th to September 16th, 2006, to undertake interviews with key actors in the field of nutrition and food security and to visit institutes with relevant information. The lead local NGO partner, Yugantar, played an important role in identifying and contacting the appropriate individuals and offices. A list of institutional contacts was put together that included governmental and non-governmental organizations, research institutions, and universities that: 1) were knowledgeable on food and nutrition issues specific to Hyderabad, 2) were participating in programs or interventions in these fields of interest, or 3) were identified as potential key players in effecting change in the food and nutrition scenario within the city.

Generally, identified individuals were very accommodating and interested in meeting with us. The meetings took place at their offices and, when appropriate, other key individuals from their same office joined us. In addition, we visited a number of libraries at universities and research institutions to perform in-depth searches and gather relevant documentation not otherwise easily available outside India. During our meetings and library visits, we primarily looked to gather information on the conditions, determinants, and context of food and nutrition security in Hyderabad during the past 20 years. We focused on these issues and how they relate to the poor, malnourished, and food insecure. We also looked for information on food distribution and marketing structures within the city.

Table 2 below provides a list of offices and individuals visited. See Annex 1 for more detailed information on the relevance of the institution's or individual's work to the nutrition and food security situation in Hyderabad and for a summary of key outcomes of the meetings.

Earlier visits to Hyderabad suggested information on food and nutrition issues in the city was generally limited or outdated. The pilot project therefore commissioned separate studies to gather up-to-date information and to provide some data for comparison with the studies that were available. Although time and funds were limited, small-group discussions on food and nutrition were carried out in two communities, as was a quantitative survey (also in two communities, of which one coincided with the qualitative work), which collected data on anthropometry and dietary patterns.

In selecting the study communities, we decided that, although it would be difficult to cover all key factors affecting the food and nutrition situation in Hyderabad, it was important for these communities to be representative of the ethnic and language differences found across the city as well as the varying length of time low-income settlements have been in existence. It was therefore decided to select Rahmath Nagar colony for both quantitative and qualitative data collection. Rahmath Nagar, within Talabkatta, is located in the Old City, the oldest and most central part of the city. It is primarily Muslim and representative of a well-established community. We also selected Papi Reddy colony within Chandanagar, which is located outside MCH limits, but within the rapidly developing areas of HUA. It is primarily Hindu and representative of a new and more transient population. The qualitative study was carried out in Papi Reddy colony. Due to unforeseen difficulties in carrying out the quantitative study there, Addagutta was chosen as the second community for the quantitative work. This slum is located in the city of Secunderabad, Hyderabad's "twin city."

Universities:

- Acharya N G Ranga Agricultural University
  - Dr. Rajyalakshmi, Professor and Head, Food and Nutrition Department*; and Prof. Chowdry, former Professor and Head, Agricultural Economics Department
- Osmania University
  - Dr. Kodandram, Professor, Political Science Department
- University of Hyderabad.-
  - Dr. Ramachandraiah, Professor

Research Institutes:

- Administrative Staff College of India*
  - Mr. Srinivas Chary, Director of Centre for Energy, Environment, Urban Governance and Infrastructure Development; and Mr. B. Venkata Rao, Associate Professor, Health Studies
- Centre for Economic and Social Studies*.-
  - Dr. Mahendra Dev, Director; Dr. Ravi, Researcher; and Dr. Galab, Senior Fellow
- National Institute of Nutrition*.-
  - Dr. Veena Shatrugna, Deputy Director, Maternal and Child Health Division; Dr. Shahnaz Vazir, Assistant Director, Field Division; Dr. Subba Rao, Research Officer; Dr. Raghunatha Rao, Assistant Director, Extension and Training Division; Dr. Radha Krishna, Assistant Director, Maternal and Child Health Division; and Dr. A. Laxmaiah, Assistant Director, Community Studies Division
- International Water Management Institute (IWMI).-
  - Dr. Pryanie Amerasinghe, Bio-medical Research Scientist
- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).-
  - Mr. Srinivas Reddy Srigiri, PhD Candidate

Government offices:

- Civil Supplies.-
  - Mr. Bhanwar Lal, Commissioner of Civil Supplies and Secretary to Government
- Municipal Corporation of Hyderabad.-
  - Mr. Harsha Vardhan, Additional Commissioner, Works; Mr. Rama Mohan Rao, Additional Commissioner, Health and Sanitation; and Mr. Ch. Janaradhan Reddy, Deputy Project Officer, Urban Community Development
- Hyderabad Urban Development Authority
  - Mr. Jayesh Ranjan, Vice Chairman

Non-governmental organizations:

- Naandi Foundation
  - Ms. Leena, Senior Program Officer of Midday Meals
- CARE
  - Ms. N.V.N. Nalini, State Program Representative
- Confederation of Voluntary Associations (COVA)
  - Mr. Ali Asghar, Director
- Satyam Foundation
  - Mr. Sudipto Pal, Officer
- Yugantar
  - Mr. M. Sashi Kumar and Ms. K. Lalita

Note: * indicates places where libraries where visited.

Table 2: Organizations and individuals visited

4 Research Findings

4.1 Nutrition and food security: Current conditions in Hyderabad

India has some of the highest levels of malnutrition among children in the world. Almost half (46 percent) of all children under 3 years of age are stunted[3] and 16 percent are wasted[4]. Although undernutrition is more prominent in rural areas, it is nevertheless a serious concern in urban areas. More than one-third of children in urban India are underweight or stunted (IIPS and ORC Macro 2000). Urban food insecurity is also a concern. In 1999-2000, 13.4 percent of the total Indian population consumed less than the minimum dietary energy requirement of 1890 kcal per person per day (MSSRF 2002).

The state of Andhra Pradesh (AP) fares better than the nation as a whole, but levels of malnutrition are still worrisome. In Andhra Pradesh, 38 percent of children 0-3 years old are stunted and 9 percent are wasted (see Figure 3). When disaggregated by urban and rural areas, urban centres are better off, with 29 percent stunting and 8 percent wasting, compared with 41 percent and 10 percent, respectively, in rural areas. Although stunting levels are much lower in the urban centres of Andhra Pradesh than rural areas, they are still surprisingly high.

In terms of food insecurity, in 1999-2000 17.6 percent of the urban population in Andhra Pradesh consumed less than the minimum energy requirement of 1890 kcal per person per day, somewhat higher than the national average (MSSRF 2002). In addition, a food access index[5] put forth by MSSRF (2002) shows Hyderabad as having a relatively unfavourable position with regard to household food access compared to other large cities in India, such as Mumbai, Kolkata, Bangalore, and Delhi. Hyderabad has a cumulative rank value of 68—lower than the median value of 78.5.

Our review otherwise found very little information on the levels of food and nutritional insecurity in Hyderabad, and even less on its causes. The studies sponsored under this pilot project were among the few in almost twenty years on these issues. The pilot project was not

[3] A child is classified as "stunted" if his or her height-for-age z-score is -2 standard deviations below the median using the 1978 NCHS/WHO reference population.

[4] A child is classified as "wasted" if his or her weight-for-height z-score is -2 standard deviations below the median using the 1978 NCHS/WHO reference population.

[5] Indicators used to compute the index include unemployment rate, proportion of population engaged in casual labor, literacy rates, levels of poverty, and juvenile sex ratio. This uses data from the early 1990s.

comprehensive enough to be representative of conditions across Hyderabad, but our quantitative study (Community Studies Team 2007) provides a window into the extent of malnutrition in vulnerable populations and how it compares to the overall urban rates of Andhra Pradesh (see Figure 3). In the urban slum of Rahmath Nagar, it was found that 12.9 percent of children 6-24 months were stunted, significantly less than the prevalence found in the urban slum of Addagutta of 41.7 percent. Wasting levels were higher in Rahmath Nagar (20 percent) than in Addagutta (13.9 percent), but, given the sample sizes, the figures are not statistically different.

Compared with urban Andhra Pradesh, both slums have slightly higher levels of wasting, but this is not surprising as these are some of the poorer areas of Hyderabad. Addagutta has alarmingly high levels of stunting, much higher than urban Andhra Pradesh and, in fact, very similar to the situation in rural areas. Further research is needed to understand the reasons for the variation and for the surprisingly large differences between the areas, but clearly malnutrition is a serious problem in the slums in Hyderabad. Distressingly, as in other cities in the developing world, the levels of stunting in poor urban areas are often not so different from those found in rural areas.

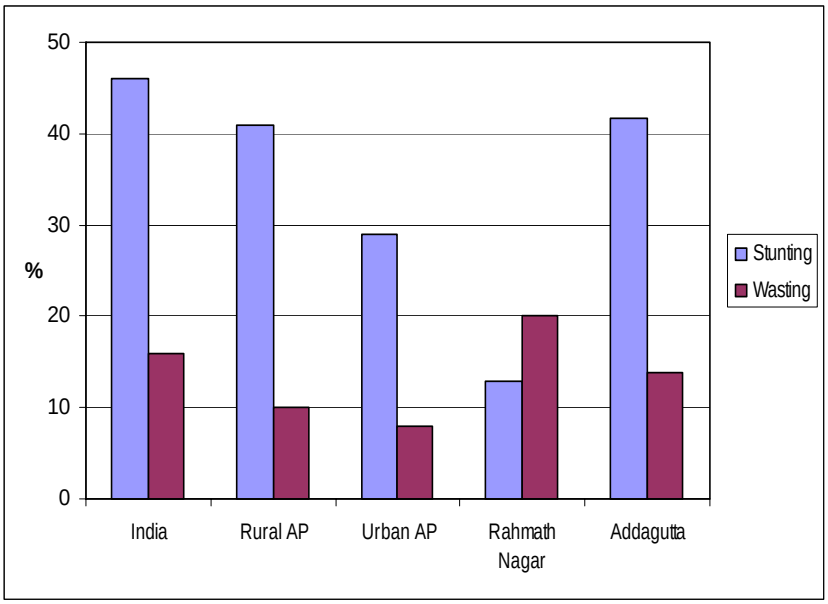

Figure 3: Contrasting rates of malnutrition: Country-wide to the slums of Hyderabad

Perhaps surprisingly, at the same time, overweight and obesity are also concerns. Laxmaiah (2003) estimated the prevalence of overweight and obesity in Hyderabad among adolescent school children ages 12 through 17. The prevalence of overweight was 4.5 percent among girls and 4.8 percent among boys, while obesity rates were 1.8 percent among girls and 1.3

percent among boys. Interestingly, the prevalence of overweight and obesity was significantly higher among children studying in private schools (between 8 and 9 percent) compared to children studying in government schools (only 2 percent). In addition, children with upper-middle and high socio-economic status (SES) had a prevalence of 7 percent, while among those with low and low-middle SES only 3 percent were overweight or obese.

As with undernutrition, income plays an important role in nutritional well-being. Lower income groups suffer from underweight and limited dietary diversity, while higher income groups are now starting to suffer from overweight. Given that rates of overweight and obesity are higher among higher-income groups, with continued economic growth, Hyderabad will soon have to deal with a double burden: policies and programs will have to deal with both undernutrition and overweight at the same time.

The subsequent sections attempt to understand why Hyderabad continues to face such disturbing levels of malnutrition and food insecurity. They summarize available literature and findings from the companion studies but clearly indicate that further in-depth research on causes and solutions is urgently needed.

Following the determinants laid out in the conceptual framework, this review first looks at the general socio-economic and political conditions at the national and city levels; it then assesses issues of food availability and access, including food supply and distribution within the city and household resources to obtain appropriate foods. Finally, it looks at environmental conditions, including availability of safe water and adequate sanitation infrastructure, as well as the intra-household environment, which can affect individual dietary intake and child feeding and caring practices.

4.2 Nutrition and food security causal factors

4.2.1 Political, social, and cultural environment

The conceptual model makes evident that factors beyond the household—at the community and national levels, for instance—are important determinants of how effectively households are able to utilize their resources to meet their food and nutrition requirements. Policy frameworks and the social, economic, political, and cultural environment can create space for action or inhibit change and responses. In the context of Hyderabad, not only is it important to gain insights into the political discourse at the local and municipal level, it is also necessary to recognize national political agendas as many of the programs implemented in Hyderabad are set by the national government. This section therefore explores the overall political

environment in India—national, state, and local—in regards to hunger and malnutrition. In addition, the cultural and societal environment within Hyderabad, such as women's education, gender inequality and caste, are examined.

Political determinants

Since independence, the government of India has committed itself to ensuring good nutritional status among its population, as illustrated by Article 27 of the Constitution that states: "Raising the level of nutrition, standard of living, and improvement of public health are the primary duties of the State" (Subba Rao 2004). Attention to food and nutritional security from both national and state level government has undergone many changes since then. Adoption of the Public Distribution System (PDS) and design of the Integrated Child Development Services (ICDS) were first steps towards reducing malnutrition and hunger in the country[6]. Another positive step came in 1993 when the Government of India adopted a National Nutrition Policy. In this document the government acknowledged that the problems surrounding food and nutritional security would not be resolved unless a multisectoral approach to the alleviation of malnutrition was adopted. It gave equal attention to increasing foodgrain production, improving PDS to ensure food security, and increasing community health and education programs to improve nutrition (Qadeer and Priyadarshi 2005). In addition, it gave special priority to the most vulnerable segments of society—women, mothers, and children—and drew attention towards integrating social programs that focused more heavily on nutritional issues at the individual level (NRCW n.d.).

The National Nutrition Policy was an important step forward in recognizing that food-based interventions are not sufficient. These have to be complemented with schemes that address other determinants of malnutrition, such as a high disease burden and inadequate infant and young child feeding and caring practices. Yet, in spite of this change in policy, India's most important early child development intervention—ICDS—continues to focus its priority on food supplementation rather than on nutrition and health interventions (Gragnolati et al. 2005). The size and capacity of Indian institutions, including government and civil society, give them important reach and technical capacity at local, state, and national levels, and allow for program implementation that many developing countries cannot match. Yet, levels of malnutrition remain high. Prevalence rates can be nearly double those of sub-Saharan Africa; and the rate of decline is much slower than other countries with similar

[6] See Section 4.3 for a detailed description of these programmes.

socioeconomic constraints (Gustafson 2006). Urgent changes are needed to bridge the gap between policy intentions and implementation on the ground.

Many of the published articles reviewed generally agreed that Indian policy was moving in the right direction of creating a more enabling environment for the reduction of malnutrition when the Tenth Five Year Plan (2002-07) was crafted. Agricultural scientist Dr. M.S. Swaminathan, in an article published in *The Hindu* in 2003, points to the adoption of important new nutrition perspectives in the Tenth Five Year Plan (2002-07). He states that this plan "shifted emphasis from food security at the household level to nutritional security at the level of each individual… The inter-sectoral nature of chronic hunger has been recognized. By shifting attention to individuals, the strategies adopted will be based on the principle of social inclusion and will help foster a life cycle approach in nutritional interventions." Statements such as these are prominent in the literature, as are sentiments of inexplicability as to why, even though favourable legal structures and political commitment seem to exist, effective actions and improvements in food and nutrition security still seem hard to come by.

Critiques of the Tenth Five Year Plan focus on an apparent inability to implement the directives it set out to achieve. More worrying, however, is emerging disapproval of the Eleventh Plan, which will be finalized this year. The comments note that the Eleventh Plan fails to pay any attention to food and nutrition security. This comes as a surprise, given the momentum and political dialogue seen in previous documents (Swaminathan 2006). The intent of the new five year plan is to restructure policy to achieve faster and more inclusive growth and hence reduce poverty and inequality (Planning Commission 2006), but failure to place nutrition at the centre of a development agenda will hamper attempts to reach development goals, as noted earlier in this document.

Reasons usually identified as holding back progress on improving nutrition in developing countries include lack of political will and insufficient financial resources. However, this does not seem to be the case in India (at least not until the Eleventh Plan was drafted). As explained by Gustafson (2006), "Although lack of political will can include a number of commitments that may weaken implementation, on the whole, Indian society and its government and politicians have consistently given high priority to the issue of hunger, evidenced by the level of public resources going into public distribution and other social programmes such as PDS and ICDS." While political dialogue appears to exist in India, other factors may explain why India has failed to reduce levels of malnutrition (Gragnolati et al. 2005; Ghosh 2006; Dev et al. 2004). Some of the shortcomings identified include lack of

knowledge of the most cost-effective interventions; a misguided perspective that transfers to the poor, especially food, are the most successful interventions; inadequate cohesiveness and involvement across stakeholders, and across state; district; and village-level government agencies; and deficient participation from the poor. This makes scaling up successful interventions difficult.

These factors also come into play in Hyderabad. Lack of state and city-level involvement, for example, is evidenced in the Hyderabad City Development Plan. In general, government coordination across sectors and municipalities that make up the Urban Agglomeration is weak. The document states that "one of the key reasons for inadequate service delivery outcomes in Hyderabad Urban Agglomeration is the overlapping arrangement in functions, roles and responsibilities of the institutions, resulting in poor accountability. The absence of an effective coordination mechanism; amongst municipal; metropolitan; and state-level agencies has implications for orderly spatial development, coordinated infrastructure provision, local economic growth, development management, service delivery and expenditure" effectiveness (MCH 2003).

Limited local participation (municipal, state) in food and nutrition programs across sectors and government agencies was also apparent from the informational meetings we had during our visit to Hyderabad. Although our visits included a wide range of institutions and government offices, little information was provided to us specific to nutrition programs (excluding agencies whose mandate is directly related to improving nutrition). Most people we talked to expressed interest and recognized the importance of nutrition, and yet there was an evident lack of organization and contribution across sectors. The multifaceted nature of malnutrition calls for involvement from diverse government agencies and institutions—health, education, agriculture, water, infrastructure—and existing programs will be more successful when multisectoral participation is achieved.

The literature, in addition to highlighting failings in program design and administration, also points to a fundamental limitation in India's governance structure to enforce the right to food.[7] Even though the government of India has ratified a number of international human rights agreements, such as the *International Covenant on Economic, Social, and Cultural Rights* and the *Convention on the Rights of the Child*, more needs to be done to fully address

[7] A rights-based approach is normatively based on international human rights standards and operationally directed towards promoting and protecting human rights. Its principles include equality and equity, accountability, empowerment, and participation (for more information, see UN Human Rights in Development, available at http://www.unhchr.ch/development/approaches-04.html).

the issue of the *right to food*. In establishing a rights-based system, the government is accountable for its actions and has a duty to carry out its obligations to fulfil the rights of its citizens. The political environment in India is in fact changing, exemplified by the Supreme Court's order in 2001 calling upon state governments to identify all families below the poverty line and provide them with the necessary food assistance. This is an important step forward, but effective mechanisms of accountability at the local level are missing, whereby local people would know their rights and channels would be in place through which to exercise them (Kent 2002). Importantly, this issue is receiving attention, as Yugantar and other NGOs in Hyderabad are working to establish such mechanisms.

Social and cultural determinants: Caste and Education

High levels of hunger and malnutrition are further exacerbated by significant inequalities found across gender, socioeconomic groups, and castes (Gragnolati et al. 2005), which are present in rural and urban areas alike. In Hyderabad, as in other urban centres, people belonging to lower castes can only perform certain ascribed jobs, such as disposing of garbage, cleaning drains, and sweeping roads, which hampers their social mobility. Children raised in these vulnerable households are more likely to suffer from hunger, malnutrition, and lack of access to resources.

Society-wide gender inequality, seen in the labour market of Hyderabad as wage differentials between male and female workers, is widespread (MSSRF 2002). For example, in Papi Reddy male labourers earn between Rs 100 to 150[8] per day, while women earn on average Rs 80 per day (Community Studies Team 2007). Discrimination against women can have serious negative effects on food security and their own nutritional status as well as that of their children (IFPRI 2005). A study by Smith et al. (2003) found that, if women enjoyed the same status as men in South Asia, approximately 13.4 million fewer children would suffer from malnutrition. The explanation behind such findings is that, when women are empowered and have equal standing as men, they themselves are better cared for, have better nutritional and health status, and are more able to provide high-quality care for their children.

These are important issues, and yet the literature on Hyderabad presents little information to fully comprehend their extent and impact on food and nutrition security. We have only limited studies on how urbanization can affect changes in social status, for example; or increase or affect women's control over decisions, including child care and spending on

[8] As of April 2007, 1 US dollar equals about 42 Indian Rupees and 1 Euro equals about 57 Indian Rupees.

children's needs; or influence dietary and caring practices, such as exclusive breastfeeding. We have even less information on the policies and programs necessary to encourage positive change in a megacity context. Future studies should address this research gap.

Educational attainment, particularly among women, is another important societal determinant that can constrain access and use of available resources to secure food, health, and care in the household. In India, data from 1998/9 show that 49 percent of females and 26 percent of males age six and above are illiterate. Although these figures are high, they are a substantial improvement from 1991 when it was found that 57 percent of females and 31 percent of males were illiterate. Assessing urban-rural differentials, urban areas have much better education levels—56 percent of rural females and 31 percent of rural males are illiterate compared to 28 and 13 percent, respectively, in urban areas (IIPS and ORC Macro 2000).

In Hyderabad, illiteracy rates also differ by gender and, overall, are substantially worse than national urban figures, including other, larger cities such as Mumbai, Delhi, Chennai, and Kolkata (see Table 1 in Section 2.1.1 above). Data from 2001 show that 35 percent of females are illiterate as are 26 percent of males (MSSRF 2002). Surprisingly, then, more than one of three women and one of four men in Hyderabad are illiterate in 2007.

The quantitative study (Community Studies Team 2007) suggested slight improvements over these rates in our pilot-study areas. Illiteracy levels in Rahmath Nagar and Addagutta were 27.5 and 32.4 percent, respectively. Participants in the focus group discussions in Rahmath Nagar, on the other hand, suggest that illiteracy rates are higher than those found by the quantitative study. Men and women stated that illiteracy rates are close to 50 percent among men and only a small minority of women know how to read and write.

Furthermore, the quantitative study showed that only a small percentage of women have attended high school and beyond—7.6 percent in Addagutta and 13.7 in Rahmath Nagar. Men, too, have low high school attendance. Focus group discussions in Rahmath Nagar indicated that most men drop out of school between fifth and seventh grade. Again, these figures illustrate that urban residency does not guarantee improvements in social indicators. These levels are in fact only marginally better than the overall figure for Andhra Pradesh of 7 percent (both men and women, urban and rural) (IIPS and ORC Macro 2000). With the ability to take advantage of employment opportunities being highly dependent on a labourer's skills and cognitive abilities, the low levels of literacy and education are of deep concern.

An important finding from the community studies is that changes may be underway. There is a general belief that education is important and necessary to improve standards of living. Families are doing what they can to send their children to school, despite financial difficulties.

Although demand for education is increasing, it is not sufficient to improve educational attainment unless the government puts a system in place to improve availability and access to education for low-income families. Further research and analysis is needed to understand what can be done to change the particularly low levels of educational attainment among women.

4.2.2 Food availability and access

This section looks at two aspects of food security—availability and access. Food availability refers to the existence of food either at the market or through own-production. This term can be applied at a macro level, such as national or state, or micro level, such as the household. For the purpose of this study, food availability at the state level is briefly examined, but more emphasis is given to food distribution within Hyderabad and across its differing socio-economic neighborhoods. Access refers to the ability of a household to obtain food from what is available for a diverse and appropriate diet. This section examines determinants of access in the context of Hyderabad, particularly households' purchasing power, influenced by income, prices, and labor patterns. Other household determinants can also affect access, particularly at the individual level, such as intra-household food distribution and dietary cultural practices. However, since these factors are more related to intra-household dynamics, these are discussed separately in Section 4.2.4.

Hyderabad's ability to provide sufficient food to its inhabitants partly depends on the food availability in the surrounding rural areas of Andhra Pradesh. Food crops grown include cereals, sugar cane, chillies, groundnuts, and a variety of pulses. However, cereals remain the most important food crop in the state—an important staple food that, even though per capita consumption has undergone a steady decline since the 1970s (Radhakrishna and Ravi 1992; Rao 2000), continues to contribute as much as 70 to 80 percent of calories among the lower-income groups (MSSRF 2002). Therefore, because of the importance of grains in the food security status of low income populations, food availability at the state level is described using foodgrain production data.

In 1994, Andhra Pradesh suffered a marginal deficit of 10 to 18 percent in cereal production (that is, per capita consumption was greater than per capita state production), but by 2000, the deficit had decreased to less than 10 percent (MSSRF 2002). Even during years of reduced production, the state continues to achieve regional food adequacy by procuring foodgrains from other states. And yet, state-level "food security" does not necessarily translate into household-level food security. For people living in a city, two factors are

especially important—food has to be easily available and families have to have the purchasing power to access an adequate and varied diet. Urban and peri-urban areas may have the possibility of accessing some food types through urban agriculture and raising livestock (especially chickens), but this is not always a viable option for many families and, in any case, is not usually sufficient to close the gap in food and nutritional needs.

Hyderabad has a variety of outlets where people can purchase their food. As confirmed by the community studies, households traditionally buy their food from small family-owned shops, local markets or bazaars, or street food vendors. The type of locality visited depends on the income level of the individual and the convenience of its location. During the past few years, the food distribution scene in Hyderabad has undergone dramatic change, particularly as tastes and preferences shift towards bigger retail stores. Due to government regulations that prohibit foreign direct investment, supermarkets have not taken off as rapidly as has been seen in Latin America and Africa. Yet changes are occurring, and retail sales are forecast to increase more rapidly in the coming years as economic growth continues. Supermarkets are providing cheaper foods and commodities with increased variety and quality. This, coupled with higher mobility among consumers, is rapidly shifting purchasing patterns from small-scale enterprises to the larger retail stores (Lohr and Dittrich 2007). Furthermore, supermarkets are expanding at a faster pace than other retail stores because of "convenience, higher standards of hygiene and the attractive ambience" (Euromonitor International 2004).

Despite changing purchasing patterns, the tradition of selling foods on the streets continues to play an important role in the city's food provisioning system (Wipper and Dittrich 2007). The urban poor, particularly, rely on street foods to provide them with a variety of food items that otherwise would not be accessible to them in close proximity to their place of residence. Recently, higher-income classes are also relying on street vendors, mostly for quick and cheap lunch meals. And yet, even though people throughout the city continue to depend on this food distribution system, new government traffic-and food-safety rules may jeopardize their existence. Unfortunately, this does not only mean reducing food purchasing options for the urban poor; it also means reducing their livelihood options. Street food vending needs to be understood in this context, to ensure that new regulations do not negatively affect a segment of the population that is already extremely vulnerable.

Rythu bazaars are an innovative food marketing strategy recently initiated by the Andhra Pradesh government. The bazaars are an alternative food distribution initiative through which both farmers and consumers can benefit. In essence, Rythu bazaars are farmers' markets. They provide a market location where consumers can interact directly with producers, thereby

eliminating middlemen. This process ensures better prices to the farmers and lower prices, usually for fruits and vegetables, to consumers. The bazaars are located on government-owned land. Facilities such as stalls and sanitation infrastructure are covered through government funds from the Department of Agricultural Marketing. The goal is for each bazaar to generate its own income in order to cover upkeep expenses and, in the long-run, for them to become cooperative societies managed directly by the farmers. Existing bazaars have received positive reviews from both consumers and producers. One suggestion is to improve their location, so they are situated closer to consumers and still easily accessible to farmers, but away from wholesale markets (FSI 2003).

In low-income settlements, neither supermarkets nor Rythu bazaars are yet prevalent. Most of the poor get their food at *kirana*[9] shops, government-run ration shops (affiliated with the PDS), and street vendors. Although all these options are widely available, the variety of foods sold at *kirana* and ration shops is limited. Experience in other developing-country cities suggests that, although these shops provide a needed service, they are not usually linked to an efficient marketing chain, and so charge higher per unit prices to the poor than those available in larger markets. At the same time, the poor cannot usually afford to buy in bulk, which again means they cannot take advantage of lower per unit prices.

Residents of Rahmath Nagar and Papi Reddy (Community Studies Team 2007) said it was not difficult to purchase dry foods, such as rice, wheat, dal, sugar, spices, and tea, from the local stores, but fresh fruits and vegetables were not as easily available. In Papi Reddy, in fact, fruits and vegetables cannot be purchased within the community; consumers have to travel 5 or 6 kilometres to the nearest Rythu bazaar. Rahmath Nagar residents have only a limited assortment of vegetables (primarily green amaranth and spinach). These can be purchased from local street vendors, while fruit can only be bought from the food market in Charminar, located 3 kilometres away.

The inadequate availability of food found in slums is compounded by limited purchasing power among slum inhabitants. The relative cost of living is high, particularly among those who rent their homes, and income flows are usually low and unreliable. Data on income and wealth are limited in the literature, so instead we examine employment rates and types of labour as suggestive of income-earning abilities of households and, therefore, indicative of capabilities to obtain food in the market.

[9] A small family-owned convenience store.

In Hyderabad, the male worker participation rate (WPR) in 1993/4 was 750 per 1000, but among women it was only 164 per 1000. While WPR indicates access to employment, it is also important to look at the type of employment, particularly casual labour and self-employment, as both these categories can indicate low and unreliable levels of earnings. Available data show that 55.5 percent of males aged 15 years and above are regularly employed, 13.2 are engaged in casual labour, and 31.3 are self-employed. Among women, 47.9 percent are regularly employed, 30.9 are engaged in casual labour, and 21.2 are self-employed (MSSRF 2002). Depending on the types of jobs categorized as self-employed (for example, rickshaw pullers are sometimes included in this category), these figures suggest that at least 13 percent of males and 30 percent of women participate in income-earning activities that likely do not provide them with enough income to access an adequate quantity and quality of food.

These quantitative findings are illustrated in the livelihood patterns found in the slums of Rahmath Nagar and Papi Reddy (Community Studies Team 2007). In Rahmath Nagar, males are the wage earners in the household and work primarily in casual labour. Specific jobs include rickshaw pullers; street vendors of footwear, bangles, or fruit; and mechanics. These jobs generally bring in about 2 or 3 dollars a day, but if their work is far from their home a large percentage of their earnings is spent on transportation costs. Some males have better-paying jobs, including working in shops, hotels, or as assistants in government offices. In these cases, they receive a monthly salary and are able to enjoy a more reliable source of income.

Rahmath Nagar is a conservative Muslim community, and only a small percentage of women there participate in paid employment, never in jobs that require them to leave their home. Those who are employed from home generally partake in handiwork, such as manufacturing *agarbathis* (incense sticks) or stitching beadwork on *sarees* (a traditional dress worn by women). The grave financial situation of many families obliges children to work, generally at petrol stations, hotels, or mechanic shops.

In Papi Reddy, males also generally work and earn daily wages in informal jobs. Their income situation is more precarious than those in Rahmath Nagar, however, as their jobs tend to be those that vary with the seasons. Many have jobs in the construction sector, where most work occurs in the dry summer months. During the monsoon months, availability of work decreases, and they are generally only employed for a few weeks at a time. The newer and more transient characteristics of this slum may also contribute to the prevalent difficulties in securing a job throughout all months of the year. In contrast to Rahmath Nagar, residents in

the community of Papi Reddy are more recent migrants. They may lack the social support networks that, extending beyond the community, can help to secure a constant flow of employment opportunities or serve as the basis for coping strategies. Although not examined in the community studies, caste (which often signifies an ascribed occupational status) and power dynamics with local patrons may also play a role in accessing employment (as studied in other parts of India by Loughhead et al. 2001).

Food insecurity among households was evident in both communities from accounts among focus group participants. In Rahmath Nagar, during periods of financial crisis, households use a number of coping strategies that directly impact the quantity and quality of their diets. These strategies can include eating broken rice (a cheaper, lower-quality rice), forgoing more expensive items, and reducing number of meals or intake of food, particularly among older members of the family.

In Papi Reddy, as explained above, seasonality has a direct impact on income and, hence, on food security. Here households reduced expenditures by reducing food consumption, which has particularly detrimental impacts on children and the elderly because of an increase in disease prevalence during the rainy season. In addition, focus-group participants in both communities commented that price fluctuations, compounded by limited availability of job opportunities, increased their food insecurity during the monsoon season.

The quantitative data found in the literature and the qualitative information from the community studies suggest that food insecurity in Hyderabad among the poor is a problem. Food availability is sometimes limited in slum areas, and food access among daily wage earners is hindered by limited disposable income and low rates of employment, especially during the rainy season.

4.2.3 Infrastructure, water, and sanitation

In comparing rural and urban levels of malnutrition, studies have shown that prevalence of stunting and underweight are usually higher in rural areas, while wasting is oftentimes greater in urban centres. This could suggest that children living in urban slums are more likely to experience acute levels of malnutrition due to unhygienic conditions, heightened by overcrowding and high levels of disease burden, compared to rural areas, where the type of malnutrition is more prolonged, resulting from chronic food shortages (Haddad et al. 1999). Hence, provision of basic services, such as drinking water, sewerage, and sanitation facilities, becomes an essential intervention to improve conditions and reduce malnutrition in the slums

of Hyderabad. Yet, as described below, the system in place does not always make it easy for people with the most urgent needs to access such services.

Many times slums arise as households move in and, informally and unofficially, group together. In Hyderabad, in order for inhabitants of slums to benefit from government infrastructure and services, the area first needs an official designation as a "notified" slum. The process through which this happens is complicated and sometimes lengthy as there are certain characteristics, listed in the Andhra Pradesh Official Slum Act of 1956, that need to be present in order for a locality to be officially recognized as a slum (Naido 1990). However, once this process is complete, the inhabitants are entitled to extensive government-sponsored programs, including the provision of infrastructure such as water supply, electricity, and roads. However, not all slums, particularly recently formed settlements, are notified, primarily because of lack of government funds and variation in political power. Naido (1990) explains that, since these decisions are politically charged, many times better-off areas are classified as slums, while poor and dilapidated areas remain ignored due to a lack of necessary political lobbying. Naido also argues that newer settlements composed primarily of migrants from rural areas appear less likely to be able to assemble the power needed for their locality to be classified as an official slum. If this is indeed the case, nutrition programs are even more urgent, as they can help establish community participation and empowerment and, thereby, aid the inhabitants in accessing needed government funds.

Hyderabad has an estimated 666 notified and 126 non-notified slums (MCH 2006). More than one-third of the population of Hyderabad resides in these slums, squatter camps, and other poorly constructed settlements. It is these people who suffer the most in the absence of adequate access to sanitation and water infrastructure, health services, and human and economic capital. Although drinking water supply is more easily available in urban areas, the unreliable and potentially unclean supply and persistent lack of infrastructure even in notified slums have detrimental effects on the health and nutritional status of the population. Infrastructure in non-notified slums, if it exists, is likely to be in even worse shape. The same can be said about sanitation facilities. Overcrowding and lack of open space compound the problem.

NFHS-2 (1998/9) found that 50 percent of households in the state of Andhra Pradesh have access to piped drinking water and 30 percent use hand pumps, compared with the national average of 39 percent in both cases[10]. In the urban areas of Andhra Pradesh, access to some

[10] National averages are taken from IIPS and ORC Macro 2000.

form of piped drinking water is practically universal (90 percent of households), but of these, 40 percent continue to only have access to public taps, not piped water within their residence. Data from MCH (2006) confirms these finding a large percentage of households in the notified and non-notified slums of Hyderabad do not have piped water in their households and the supply of piped water is only on alternate days. Mere existence of a system, then, is not sufficient to indicate if the population is "water secure." We must ask whether the water supply is safe, reliable, and available in the necessary quantities.

The qualitative and quantitative community studies (Community Studies Team 2007) conducted in Rahmath Nagar, Papi Reddy, and Addagutta provide some insight into the answers to these questions (see Table 3 below). For example, in Rahmath Nagar, household taps were installed more than 20 years ago, but the reliability of this water source has improved over the years. At first, water was only available once in four or five days. In the past two years, water availability has increased to approximately four hours every two days. This still indicates some problem with availability, and we did not check on the water quality, but the situation apparently has improved somewhat.

The quantitative study conducted by the Community Studies Team (2007) in Rahmath Nagar indicates that 94 percent of households have access to piped water for drinking and cooking. However, only 56 percent of households use piped water for bathing. The remaining 44 percent use well water. Depending on the quality of water from the well, this may increase exposure to water-borne diseases. In addition, most women store water in earthen pots, which could compromise its quality, a concern if this stored water is later used for drinking.

Similar findings emerged from the quantitative study in Addagutta. The only significant difference is that women in Addagutta tend to store their cooking and drinking water in metal pots—an important improvement compared to how water is stored in Rahmath Nagar. For the inhabitants of Papi Reddy, accessing an adequate supply of drinking water is more difficult. The only locally available water supply is from bore wells. This water is not suitable for drinking, so many residents travel across railway tracks to a nearby community where they can fill a pot for the price of Rs. 10. The lack of water infrastructure in Papi Reddy can be attributed to the more recent establishment and transitory nature of its residents. Other communities in Hyderabad with these same characteristics probably face similar constraints.

Table 3:

Table 3: Household water and hygiene infrastructure and practice

	Addagutta (%)	Rahmath Nagar (%)
	N = 105	N = 102
Drinking and Cooking Water Source		
Piped to residence	92.4	95.1
Public tap	7.6	4.9
Bathing Water Source		
Piped to residence	92.4	55.9
Public tap and others	6.7	44.1
Storage of Drinking Water		
Earthen jar	3.8	84.3
Metal pot	93.3	13.7
Storage of Cooking Water		
Earthen jar	1.0	70.6
Metal pot	99.0	29.4
Storage of Bathing Water		
Opaque container	68.6	76.5
Others	31.4	23.5
Covering of Water Container		
For drinking and cooking	100.0	100.0
For bathing	54.3	58.8
Sanitation		
Adults: pit/ latrine (sealed)	100.0	100.0
Children: open space	100.0	100.0

Source: Community Studies Team 2007

Regarding sanitation infrastructure, 73 percent of all households in Andhra Pradesh have no toilet facilities at all (worse than the national average of 64 percent). Twenty percent have flush toilets, and 7 percent have latrines (compared with national averages of 24 and 12, respectively). In urban Andhra Pradesh, the situation is much better with close to 60 percent having access to flush toilets and only 14 percent with no sanitation facilities. The slums of Addagutta and Rahmath Nagar appear to have improved infrastructure, as all respondents in both slums said they had access to a pit or sealed latrine. Nevertheless, a striking fact is that 100 percent of children defecate in the open. This is a major health concern, particularly in crowded areas where diseases can spread very rapidly. Limited drainage facilities and inadequate garbage disposal compound this problem. And, in Rahmath Nagar and Papi Reddy, drainage pipes are not only limited, but those that exist are open, causing major sanitary hazards during the rainy season, when overflowing drains flood the houses with raw sewage.

The situation described above resonates with conversations we had during our visit to Hyderabad. When we asked a group of professors in the Food and Nutrition Department of the Agricultural University what factors they considered to be causing such high levels of

malnutrition among children, they all agreed that unhygienic conditions was the most prominent reason. Other factors listed included high incidence of gastrointestinal infections and lack of access to appropriate health services.

Lack of availability and access to infrastructure is becoming a major concern as the number of temporary settlements in Hyderabad continues to grow at an unmanageable speed. Construction of basic services and infrastructure cannot keep up with such rapid increases in demand. It is in these settlements, without resources but with a high disease burden, that living becomes an everyday struggle. Although prevalence and type of malnutrition across all slums is not known, it is evident that, given constraints in infrastructure, resources and social programs, malnutrition is a pressing problem that needs urgent attention. Ms. Nalini, the State Program Representative at CARE, agreed with the above and stressed that one of the major shortfalls in current government and private programs is the large number of poor households that are not covered by health and social programs.

These concerns are reflected in the high rates of morbidity among children. Acute respiratory infections (ARI) and diarrhoea are the two leading causes of childhood mortality, with diarrhoea accounting for over 80 percent of child deaths in the country (Prasad and Ramachandraiah 2007). The national prevalence of children under age three suffering from ARI[11] is 19 percent. The same national prevalence is found for diarrhoea[12]. In Andhra Pradesh, the situation is not much different, with 19 percent of children suffering from ARI and 15 percent from diarrhoea. When comparing urban and rural areas, not much of a difference is found. The prevalence of ARI in urban Andhra Pradesh is 16 percent compared with 20 percent in rural areas, and 16 percent of children in urban areas suffer from diarrhoea, compared with 15 percent in rural areas. These findings are important, pointing out that city living does not always equate to healthier children. Understanding and reducing the factors that bring about these diseases among children in Hyderabad will be an important step in reducing child malnutrition. Few, if any, studies have been undertaken to address these issues, underscoring an urgent research gap.

[11] This was measured by the existence of a cough accompanied by short, rapid breath at some point during the two-week period before the survey was conducted

[12] This was measured by reported symptoms of diarrhoea in the two-week period before the survey was conducted.

4.2.4 Intra-household food and nutritional practices

If sufficient and nutritious food is available and accessible to the household, food practices and beliefs will have an impact on food purchases and consumption patterns. Intra-household dynamics and knowledge will affect individual food distribution and child feeding and caring practices. Such practices also affect child health. For instance, exclusive breastfeeding can help an infant ward off infection.

This section examines some of these determinants, particularly care and child feeding and consumption patterns. Other factors, such as intra-household food distribution or infant health practices, are equally significant. However, no information on this issue was found in the literature on Hyderabad. This is another research gap that should be examined in future studies.

Child caring practices

Child caring practices are an important factor that lacks sufficient research to understand the situation specific to Hyderabad. Nevertheless, interesting information was collected on this topic during the qualitative and quantitative studies (Community Studies Team 2007) that helps shed light on key areas that need attention (see Table 4 below).

Women in both Rahmath Nagar and Papi Reddy commented that they did not give colostrum to their newborn babies, because they believed it is unhealthy. Therefore, for the first few days mothers give their babies liquids other than breastmilk. The quantitative study indicates that 90 percent of women in Rahmath Nagar give their infants liquids other than breastmilk, primarily water and glucose water, immediately after birth. In Addagutta, 51 percent of babies received other liquids (usually honey). Almost 90 percent of mothers continue to provide their infants younger than 6 months old with liquids other than breastmilk. These practices are contrary to the WHO recommendation of exclusive breastfeeding for the first 6 months of life.

Most mothers breastfeed their children for more than six months (in Addagutta and Rahmath Nagar only 10 percent of mothers said they had stopped breastfeeding before their child was six months old). However, a majority of women introduce other liquids by two months of age. The introduction of complementary foods is not adequate either. In Addagutta and Rahmath Nagar, most mothers introduce solids before the baby is 6 months old (85.8 percent of mothers in Addagutta and 57.9 percent in Rahmath Nagar), when the recommended age is six months.

Table 4: Percentage of women reporting child feeding practices in children 6 to 24 months of age

	Addagutta (%)	Rahmath Nagar (%)
	N = 105	N = 102
Breastfeeding	99.0	99.0
Currently breastfeeding	86.7*	74.5
Give liquids (other than breastmilk) immediately after birth	51.4	90.2*
Continue breastfeeding child >6 months	90.0	90.0
Give liquids (other than breastmilk) to child <6 months	89.0	87.0
Start solids when child <6 months	85.8*	57.9
Start solids when child >6 months	14.3	42.1*

Note: * denotes significant difference between communities Source: Community Studies Team 2007

In sum, although most children do receive some benefits of breastfeeding, few mothers practice exclusive breastfeeding. The benefits of breastfeeding, especially exclusive breastfeeding, are well established, particularly in unsanitary conditions where the introductions of other liquids may increase exposure to contamination and disease. The fact that most children receive breastmilk is positive; however, an increased understanding among mothers and their support network of the importance of colostrum, exclusive breastfeeding, and adequate introduction of solids can have consequential improvements in the nutritional status of children.

Feeding and care practices are an outcome of complex processes in society: many times caused by poor maternal health, lack of education, excessive workload of the mother (inside and outside the home), inadequate social support from family members and community leaders, and mothers' lack of control of available resources (Jonsson 1995). The findings above call for further research to examine how widespread these child feeding practices are across Hyderabad and to better understand the causes of such practices and the constraints on achieving optimal feeding and care of children, especially in an urban setting.

Food consumption patterns

Malnutrition is not only reflected in anthropometric measurements, but can also manifest itself as micronutrient deficiencies, especially deficiencies in iron, vitamin A, and iodine. This type of malnutrition is usually referred to as 'hidden' hunger, because it can many times go undetected. Micronutrient deficiencies do not result uniquely from lack of food, but rather reflect low-quality and monotonous diets deficient in micronutrients. Micronutrient deficiencies are, therefore, not always highly correlated with socio-economic status. Although the poor are the most vulnerable to morbidity, malnutrition, and mortality, middle-

and higher-income populations are not exempt from micronutrient deficiencies. An urban lifestyle can lead to an inadequate, low-nutrient-content diet, causing not only problems related to overnutrition but also deficiency in essential nutrients.

In India, for example, iron deficiency is widely prevalent among young children and pregnant women. According to the National Nutrition Monitoring Bureau (NNMB 2003), the national prevalence of anaemia among adolescent girls is 63 percent. Vitamin A and iodine deficiency disorders are also of great concern (Measham and Chatterjee 1999). In Hyderabad, the extent of micronutrient deficiencies is less well known. One study conducted by Saibaba et al. (2002) in the urban slums of Hyderabad points to high levels of anaemia among adolescent girls (Saibaba et al. 2002). Although suggestive of the problem, it does not indicate how widespread anaemia levels are throughout the city and how prevalence may vary across gender, age, and socioeconomic groups. Also, little is known about the extent of vitamin A and iodine deficiency disorders.

Nevertheless, some studies have assessed consumption patterns among different groups in Hyderabad. These can indicate diversity and quality of diet, especially with regard to consumption of fruits and vegetables, and so suggest whether micronutrient deficiencies are prevalent. For example, Rahman and Rao (2002) conducted research in 2000 and 2002 to assess differences in diet across different socioeconomic and religious groups in Hyderabad. The studies found significant differences in dietary patterns between Hindus and Muslims. Muslims of low educational and income status consumed more cereals and millets than Hindus with similar socioeconomic status. On the other hand, consumption of milk and dairy products, fats and edible oils were higher among Hindus than Muslims, irrespective of education and income. These results are important, as they demonstrate that, as stated above, dietary behaviour is not always dictated by income levels, but often can have strong ties to other socioeconomic characteristics, such as religion in this case.

The quantitative study conducted by the Community Studies Team (2007) also identified differences in dietary diversity across two communities of similar income levels, which again suggests characteristics other than income can influence consumption preferences (see Table 5 below). In both Addagutta and Rahmath Nagar, all women interviewed stated that they had consumed cereals the previous day. However, consumption of pulses was significantly different: in Addagutta 81 percent consumed pulses the day before while in Rahmath Nagar only 34 percent did. More families (54 percent) in Rahmath Nagar consumed green-leafy vegetables than in Addagutta (17 percent). In both communities, 32 percent of households had eaten fruits (including bananas, guava, and apples) the previous day. Meat consumption

is significantly different. Whereas in Rahmath Nagar 75 percent of families ate meat the previous day, in Addagutta only 27 percent did. It could be that any nutrient deficiencies caused by the lack of meat in the diet of people living in Addagutta are compensated for by increased consumption of pulses and green-leafy vegetables, but a more exact quantification of nutrient consumption is needed.

Table 5: Foods consumed previous day of survey by any household member

	Addagutta (%)	Rahmath Nagar (%)
	N = 105	N = 102
Cereals	100.0	100.0
Pulses	81.0*	34.3
Roots and tubers	8.6	13.7
Green-leafy vegetables	17.1	53.9*
Other vegetables	36.2	39.2*
Fruits rich in vitamin A	2.9	2.9
Other fruits	34.3	30.4
Meat	28.6	74.5*
Eggs	24.8	21.6
Fish	1.9	2.0
Milk and milk products	55.2*	42.2
Oils	96.2	97.1
Spices	100.0	100.0
Sugar	98.1	99.0
Tea/ Coffee	99.0	99.0
Liquor	54.3	6.9
Pan	38.1	48.0

Note: * denotes significant difference between communities Source: Community Studies Team 2007

Even though differences in dietary behaviours are found across similar income groups, one must not underestimate the role income plays in the quality and diversity of diets. Certain social and cultural characteristics may guide food choices and preferences, but ultimately these will be dictated by the ability of households to purchase the foods they desire. Income constraints on dietary diversity are reflected in a study conducted by Vijayapushpam et al. (2003). The study found significant differences in diets across schoolchildren from different socioeconomic status (SES) in Hyderabad. Although all children, irrespective of SES, consumed rice daily, 80 percent of those in the high-SES group consumed wheat daily , compared with 44 percent in the low-SES group. Pulses were also consumed more frequently among children in the high-SES group than those in the low-SES group. Daily intake of fruits and vegetables was also significantly higher among children with high SES compared to children with low SES. However, children from the high-SES group were less likely to consume non-vegetarian food. Forty-nine percent rarely ate flesh foods compared with seven

percent in the low-SES group. These results show that, among low-income families, the diet is made up primarily of rice, roots and tubers, and, with less frequency, pulses. In contrast, families with higher incomes are able to consume a more varied diet on a daily basis, including rice and wheat, roots and tubers, vegetables, nuts, and pulses.

The lack of diversity in the diets of low-income families, and distinct food preferences among certain groups, may suggest that in fact micronutrient deficiencies are a concern for the city of Hyderabad. However, more in-depth studies are needed to assess dietary diversity and nutrient consumption and examine how and why these vary across location, ethnic, religious, gender, age, and socioeconomic groups. Such studies can also shed light on whether the larger diversity among dietary patterns in urban areas has much impact on nutritional status and, if so, what are appropriate policy and program responses.

4.3 Key programs addressing nutrition and food security in Hyderabad

An important aim of this literature review is to provide insights into programs and policies in Hyderabad that are either addressing or indirectly affecting malnutrition and food insecurity. This primarily included the identification of current interventions and key players, both among government institutions and the private sector, and an understanding of existing integration and collaboration across sectors and institutions. Following is a description of key programs and institutions.

4.3.1 Food security interventions

Public Distribution System (PDS)

PDS operates under the joint responsibility of the Central and the State Governments. The Central Government has taken the responsibility for procurement, storage, transportation, and bulk allocation of food items which include wheat, rice and sugar and kerosene. The responsibility for distribution to consumers through the network of Fair Price Shops (FPSs) rests with the State Governments. They are also responsible for operations management, including allocation within the State, identification of families below the poverty line, issuing ration cards, and supervision and monitoring the proper functioning of FPSs. Hyderabad and Rangareddy Districts currently have nearly 27,000 functioning FPSs.

Targeted Public Distribution System (TPDS)

The TPDS was launched in 1997 by the Government of India to benefit the poor and to keep the budget expenditures for food subsidies under control. Essentially, TPDS does what

its name implies – and has moved from a system of universal access to a subsidy targeted at the poor. This transition was designed to include all the poor households and considerably raise the unit subsidy and ration quota for them. The objective of keeping subsidy expenditures in check was to be met through sale of food grains to Above Poverty Line (APL)[13] households at an economical price and confining the subsidy to about 65 million households identified as Below Poverty Line (BPL)[14] families.

Though the supply of food grains for distribution at BPL prices is supposed to come from the Central Government, the success of TPDS, in terms of meeting its stated objectives, depends largely on the ability of State Governments to identify genuinely poor families, restrict the number of poor families to the number estimated by the Planning Commission, and put in place an effective and efficient delivery system.

In 2000 the Government of India launched a new program titled *Antyodaya Anna Yojna* (grain scheme for the poorest of the poor). This scheme covers the poorest strata of population within the earlier identified BPL population. Foodgrains are provided to 10.5 million families at highly subsidized rates of Rs.2 per kg of wheat and Rs.3 per kg of rice by the Food Corporation of India (FCI). The *Annapurna* Scheme was launched on the 1st April, 2000. It aims at providing food security to senior citizens who, though eligible, have remained uncovered under the National Old Age Pension Scheme (NOAPS). It provides them with 10 kg of free rice per month. The Scheme aims to cover 20 percent (1.38 million) of those individuals eligible to receive a pension under NOAPS. Andhra Pradesh has 600,000 beneficiaries covered under the *Antyodaya Anna Yojana* program, and 100,000 covered under the *Annapurna* Scheme.

4.3.2 Child health and nutrition interventions

Integrated Child Development Services (ICDS)

The purpose of this program is to improve the nutrition, health, and development of children and mothers. The program provides health, nutrition, and hygiene guidance to mothers, non-formal education to children three to six years old, supplementary nutrition for

[13] Families which are not covered under BPL are placed under this category. The stocks are issued at the Central Issue Price of Rs. 6.10 per Kg. of wheat and Rs. 8.30 per Kg. of rice

[14] Determination of the families under this category in various states is based on recommendation from the Planning Commission. A fixed quantity of 35 kg of foodgrains per family per month is issued under this category. The stocks are issued at a highly subsidized price of Rs.4.15 per kg of wheat and Rs. 5.65 per kg of rice.

all children and pregnant and lactating mothers, growth monitoring and promotion, and health services, including immunization and health check-ups. At the national level it is run by the Department of Women and Child Development, and within Andhra Pradesh it is managed by the Department of Women's Development and Child Welfare.

These services are delivered within communities through *Anganwadi* centres. The *Anganwadi* (AW), literally a courtyard play centre, is a childcare centre located within the slum area itself. It is the focal point for the delivery of services at community levels to children below six years of age, pregnant women, nursing mothers and adolescent girls. Besides this, the AW is a meeting ground where women and mother's groups can come together with other frontline workers, to promote awareness and joint action for child development and women's empowerment. All the ICDS services are provided through the AW in an integrated manner to enhance their impact on childcare. Each AW is run by an Anganwadi Worker (AWW), who is supported by a helper in integrated service delivery. Improved linkages with the health system aim to increase the capacity of the community and of women, especially mothers, for childcare and child survival and development.

Fortification

The Government of Andhra Pradesh has recently focused attention on combating high levels of micronutrient deficiencies among children and women. The Department of Civil Supplies has taken advantage of the supply system and effective outreach of the Public Distribution System to provide fortified foods throughout the state. Enriched wheat flour and iodized salt are distributed through Fair Price shops at a 50 percent discount. The program uses public campaigns and capacity building to promote awareness among the public and among health and ICDS workers on the importance of consuming fortified foods. It also focuses on the distribution side, particularly through collaboration with salt manufacturers to motivate them to produce only iodized salt.

Special Nutrition Programme (SNP)

This program was launched in the early 1970s to provide supplementary feeding to the same target group as ICDS, but only focused on tribal areas and slums. Every child receives 300 calories and 8 to 15 grams of protein, and pregnant and lactating mothers 500 calories and 20 to 25 grams of protein, every day (Nawani 1994). In Hyderabad, the program is implemented in 65 Urban Health Posts (UHPs) reaching 42,000 children 0 to 6 years old and about 1,500 pregnant and lactating women. Since the Health Services are available to slum

dwellers through the UHPs, and the Auxiliary Nurse Midwives (ANMs) conduct pre- and post-natal monitoring in slums, all SNP centres have been merged with the nearby UHPs (MCH n.d.).

4.3.3 Social protection interventions

Homes for children and women in need

The Department of Women's Development and Child Welfare is operating a number of institutions in Hyderabad to cater to the needs of children and women in difficult circumstances:

i) **Service Homes:** One service home is functioning in Hyderabad. This home is meant for rehabilitation of socially and economically deprived women from 18 to 35 years old. They are provided the training needed to upgrade their skills in various trades. Food, shelter, clothing and medical care are provided in the home.

ii) **State Homes:** One state home is functioning in Hyderabad. This home is meant for women discharged from correctional institutions and women who are unable to protect themselves. Food, shelter and clothing are provided, and training is given in various trades for self-employment, or for wage or job employment.

iii) **Rescue Homes:** One home is functioning in Hyderabad. Women who are facing trial are given shelter during the trial period. They are provided shelter, food, clothing, medical attention, and training in skills development.

iv) **Homes for Collegiate Girls:** Inmates of Children's Homes who passed 10^{th} grade and are from 15 to 25 years old are admitted to these homes to pursue higher studies. They may stay up to 5 years.

v) **Sishuvihars:** Abandoned infants and orphans below six years of age are admitted. These children are given up for legal adoption by childless couples. There are two in the state of Andhra Pradesh: one in Hyderabad and the other at Chittoor.

vi) **Children's Homes:** The Children Homes are meant for female orphans, semi-orphans, children of disabled parents, and ex-servicemen. Children 6 to 10 years old, and in special cases up to 12 years old, are admitted. Children are provided boarding, shelter, clothing and medical care till 10^{th} class or 18 years of age, whichever is earlier.

vii) **Home for the Aged:** These Homes provide peaceful and comfortable living for elderly destitute women above 60. They are given free food, shelter and clothing.

4.3.4 Educational interventions

Mid-day Meal

Because of mass illiteracy and endemic poverty, school enrolment rates in primary education are low. High drop-out rates, low retention, and a significant gap in primary enrolment for girls are the major issues faced by the government. The Mid-day Meal programme is one of the most important food interventions.

Foodgrains (rice) are supplied free of cost to children who attend school. Cooked and processed hot meals are served. The meals have a minimum content of 300 calories and 8 to 12 grams of protein. They are served each school day for a minimum of 200 days. Students also receive 3 kilos of foodgrains per student per month for 9 to 11 months in a year.

To fight hunger in the city and increase school enrolment rates, the government of Andhra Pradesh formed a public-private partnership with Naandi Foundation, a non-governmental organization based in Hyderabad, and entrusted it with the responsibility to prepare and distribute midday meals to children attending government schools in the twin cities of Hyderabad and Secunderbad. A total of 880 schools in the twin cities are included in the program, benefiting 130,000 children (Naandi Foundation 2005).

4.3.5 Livelihoods Interventions

India Population Project VIII

The Municipal Corporation of Hyderabad, through support received by the India Population Project VIII (IPP VIII), established partnerships with local NGOs and women's community groups to improve the lives and health status of the city's slum dwellers. The program delivered maternal and child health services and established a women’s health group in slums across the city (Gill 1998). Although this program is no longer running, a lot can be learned from this experience, especially how to promote collaborative networks and partnerships between the government, NGOs, civil society, and research institutions.

4.3.6 Key actors

State governments have an important role in determining the targets and priorities of public financing towards social issues such as education, health, and family welfare within their state. Although the main nutrition and food security programmes, such as ICDS and PDS, are mandated by the central government, some level of independence does exist at the state level (Galab et al. 2003). The role of MCH is also important. Not only are they already involved in nutrition programs, but they also have the capacity and responsibility to improve the living

standards of the poor through service provision, which in the long run will have lasting implications for improving the nutrition and health status of Hyderabadis. Civil society groups are becoming increasingly important in policy discourse. Strengthening their mobilization capacity should also be a priority as this can help to create a more enabling environment for improving nutrition.

An essential and priority area for study is to understand how government, civil society, and private sector actors can work together to promote food and nutrition security. As noted at the beginning of this review, we know a lot about "what" to do to address hunger and malnutrition, but we know much less about "how." The roles and responsibilities of the different actors in megacities, especially the role of the municipal administrations in addressing food and nutrition security when many programs are funded by or linked with national actors, is not clear yet. The rise of civil society, the importance of the private sector, and the relevance of the state governments in India mean that understanding and promoting effective political action and institutional arrangements among all actors will be essential to addressing hunger and malnutrition in cities.

5 Conclusion

Hyderabad is a growing and developing city, with the potential of providing a higher standard of living to its inhabitants. Yet, attracting new investment to the city, creating job opportunities, and improving infrastructure are not enough to ensure sustainable and comprehensive development. Policies need to be formulated that consider social aspects of city life, such as nutrition, health, sanitation, education, and safety. For rapid poverty reduction and improvements in people's wellbeing, overcoming hunger and malnutrition need to be among the highest priorities for action. Key public services such as provision of water and sanitation, and social programs to improve health, nutrition, and education, can play an important role in ensuring that all families benefit from the new opportunities arising in the city.

India appears to have an advantage over other developing countries, in that policy and political discourse towards improving food security and nutrition do exist. Hopefully, this will continue as the government evaluates and defines its Eleventh Five Year Plan. Yet, even

with such an advantage, seldom have such good intentions resulted in actual tangible improvements. Understanding how policy can be transformed into action on the ground is an important step in establishing effective measures to improve the food and nutrition situation of the country. Such studies are particularly relevant for enabling change in Hyderabad, as currently little is known about the city's particular policy-setting procedures and role in effecting change to improve its own food and nutritional security situation.

From the few studies available to us, it is apparent that the food security and nutritional status of the population in Hyderabad needs urgent attention. Both spectrums- under- and over- nutrition- exist among the population. Undernutrition and micronutrient deficiencies are widespread among low-income groups. This can be attributed primarily to underlying and immediate causes, including lack of adequate water and sanitation, restricted access to a sufficient and varied diet, inappropriate child care practices, and high disease burden. This is further compounded by social exclusion, many times associated with the ascribed occupational status or caste of the individual. Overweight is seen primarily among high-income groups, explained primarily by a shift in consumption patterns from cereals towards processed foods rich in fat and sugars. Although more information is needed to construct an accurate understanding of the key causal factors impacting the nutritional and food security situation of Hyderabad, these preliminary conclusions point to the issues that most likely should receive particular attention in future research.

At the same time, the underlying and immediate factors mentioned above take place within the city's unique social, cultural, and political environment. Economic growth is changing food and production patterns. These changes and public regulations are affecting the livelihoods of street vendors and of *kirana* shopkeepers as well as their accessibility to consumers. As the city expands, it also affects the surrounding environment and economy. The full implications of these changes for food and nutrition- connecting consumers more directly with agricultural producers, for example, through Rythu bazaars – remain to be explored. It is therefore fundamental to not only understand the interplay of factors at the community, household and individual levels, but also to reflect on what needs to change at the governmental and institutional levels to effectively improve the food and nutritional security situation of Hyderabad.

Key areas for future study and action

- What causes malnutrition and hunger to be so high in urban areas? How can the city pre-empt and treat the growing double-burden of under- and overnutrition? The high level of

food insecurity (calorie insufficiency) is surprising, given supposedly higher levels of income and food availability in the city than in rural areas. Hunger will not go away simply because people move to the city.

- The high levels of chronic and acute malnutrition (stunting and wasting, respectively) confirm that serious malnutrition can exist even in urban areas. The very high prevalence of 42 percent stunting among those children 6-36 months old in Addagutta rivals that of stunting found in rural areas. Rahmath Nagar and Addagutta both have high levels of wasting, with 20 percent and 14 percent, respectively – a level similar to the national prevalence, which combines urban and rural, of 16 percent.
- Dietary quality is a major concern as well, making food insecurity an issue for both the poorest and the wealthier classes. While those in the lower classes often eat a monotonous diet, missing many micronutrients, those with higher incomes eat foods that are high in calories but not especially nutritious in terms of micronutrients.
- Why do the levels of malnutrition and hunger vary so much across the city? How can programs take such diversity into account? The community studies suggest that undernutrition is a widespread phenomenon in the slums of Hyderabad. Yet its extent and effects differ across communities. The study communities have similar levels of socio-economic status and sanitation infrastructure, but have some variation in nutritional outcomes, especially in terms of chronic malnutrition. Factors such as caste, religion, geographic location, or how long the community has existed, may play an important role in explaining such findings. However, further research is needed to better understand the immediate, underlying, and even basic causes of food and nutritional insecurity, so policymakers can tailor programs and policies to address the most important constraints. Interestingly, these findings suggest that urban areas may be as diverse in terms of causes as rural areas, and hence particular analytical and operational tools may need to be developed, so policymakers and programmers can take them into account when designing and targeting programs.
- Where do the poor get their food? How do their livelihoods interact with the food system? A key part of understanding the puzzle of food insecurity and diet quality is understanding the urban marketing system. A more efficient wholesale and retail system, and one that is also accessible to the poor (in terms of price and location), can lead to relative reductions in prices for fruits and vegetables, which can help improve diet quality. Policies and

programs that connect local producers with supermarkets and consumers can be one component of an improvement strategy – but we need to know first what the elements of the chain are: who buys what from whom, and why? And how can marketing systems, especially storage and location of markets, be improved? The experience of Rythu bazaars, for instance, could be illustrative.

- We also know that street vendors provide an important source of food, especially to the poor, who often must eat away from home while they are at work. Contrary to assumptions that street vendors sell food that is highly unsanitary, studies of street vending often note that street foods are no less hygienic than those prepared at home. And in the case of Hyderabad, street foods may even improve diet quality, as many of the foods they sell are vegetarian. Given their mobility, street vendors may in any case provide an avenue to improve consumption of fruits and vegetables.

- Studies also highlight the fact that street vending provides income to many poor people in the city. Imposing regulations without fully understanding the role of street foods in diets and employment may lead both to reduced diet quality and increased levels of poverty.

- How does the urban environment affect child feeding and caring practices? What programs need to exist to improve caring and feeding in the city? We know that appropriate child feeding and caring practices can have significant, even astonishing, effects on reductions in child malnutrition, even in low-income communities. The pilot project studies were important in uncovering key shortfalls in feeding practices in Hyderabad. Even though breastfeeding is the norm, problematic practices are widespread—discarding of colostrum, providing liquids other than breastmilk to young infants, and starting solids before the child reaches 6 months of age.

- Programs that seek to give the mother information needed to improve care and feeding behaviours have been highly effective elsewhere, but much of the evidence comes only from rural settings. In an urban environment, we still need to know why such practices exist, when, usually, mothers in these areas have higher average levels of education and better access to health providers than those in rural areas. What constraints prevent women from providing optimal feeding and caring practices to their children?

- Specific challenges that need to be explored include not only the usual concerns, such as traditional belief structures, but also urban-related ones, such as how to feed the baby breastmilk if the mother must work outside the home, or how time constraints or the rising

presence of supermarkets and fast-foods may affect weaning practices and the quality of complementary feeding. Other challenges include poor mental or physical health amid the stresses of urban life, lack of education, excessive workload, and low social status, which can result in inadequate social support and lack of control of available resources. We already know that women in Hyderabad suffer from gender inequality in the form of wage differentials and poor educational attainment, but the question remains as to the impact this has on mothering.

- How can municipal mechanisms be improved to better provide basic services? How can infrastructure-deficient communities meet their needs for water and sanitation? What hygiene and sanitation behaviours are key to good nutrition in an urban setting? The poor and crowded areas of Hyderabad urgently require adequate basic services, yet the process through which these settlements become entitled to government funds is complicated, and many times unfavourable, especially to newer, migrant communities. This is evident from the lack of water availability in Papi Reddy colony.

- Unreliability of water supply and lack of good sanitation infrastructure for sewage are important factors in explaining the high disease burden, especially diarrhoea, among the urban poor in Hyderabad. Again, the differences between urban and rural areas are small: Sixteen percent of children in urban Andhra Pradesh suffer from diarrhoea, which is even higher than the 15 percent found in rural areas.

- Although the connection between malnutrition and water accessibility, quality, and quantity is widely accepted, scientific studies of these links are scarce. Studies are needed to examine these links and identify practical ways to intervene to ensure water of sufficient quantity and quality arrives at households, even when infrastructure is poor. Studies are also needed to identify the most effective hygiene behaviours and to understand what policies and programs are needed to promote them in an urban environment. Sometimes knowledge already exists, but needs to be transferred. Various African cities, for example, have promoted the construction of Baby-Friendly Latrines so children need not defecate in the open.

- Understanding and reducing the factors that bring about high morbidity among children in Hyderabad will be an important step in reducing child malnutrition. Few, if any studies have been undertaken to address these issues, underscoring an important research gap that calls for urgent attention.

- What needs to happen to strengthen political commitment and improve coordination and action among policies and programs? Hyderabad is a complex urban environment, spanning a diversity of actors and political affiliations and having a high degree of ethnic and religious heterogeneity. Many different actors participate in different ways and at different levels to affect the trio of elements—food, health, and care—that underlie food and nutrition security. For example, the private sector—agricultural producers, industry, retailers and wholesalers—have much to do with the food supply. Municipal authorities have significant control over planning of urban infrastructure, such as provision of water and sanitation. The central government manages most nutritional and poverty programmes, including those that focus on caring practices, and is largely responsible for health services. At the same time that each of these actors has different primary responsibilities, it is also clear that their actions overlap and may even require coordination with the others. State and municipal authorities, for instance, have important roles to play in fund allocation and program design and implementation, even of national food and nutrition programs.

- The challenge is to get authorities, as well as civil society and the private sector, to take nutrition seriously as an input into economic development and to get them to work together to have food, health, and care arrive at the same time at the same place. In many places, as in India and in Hyderabad, they do not. Even when political commitment exists, program and policy coordination is lacking. And often political commitment does not extend to fully understanding and "owning" the issue, or following through on pledges to action.

- The empowerment of the poor and the establishment or strengthening of mechanisms of participation can be important in order to generate political commitment and response (Cotlear 2006, Narayan-Parker 2002). Knowledge and skills among family members, particularly mothers, must be improved in order for them to participate actively in the process of social and economic change. But we have little experience in food and nutrition, and hardly any in an urban context, on how to promote empowerment and how to generate a sense of ownership, responsibility, or accountability among the multiple actors and stakeholders involved.

- Actionable research is needed to understand the political dimensions of policy change and of program coordination in food and nutrition. Without such an understanding of how policymakers and other stakeholders use research to improve programs and policies or of how best to encourage collaboration, coordination, and accountability among the different

actors, the production of additional research on the issues of hunger and malnutrition will have no or little effect. Partnerships and collaboration must be fomented and established among key actors, including local government, civil society, private sector, and NGOs. Once again, we need not only to know "what" to do, but "how."

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Appendix 1: Organizations and individuals met in Hyderabad

Name	Organization	Area of expertise	Areas for collaboration
Dr. Rajyalakshmi	Dept. of Foods & Nutrition Agricultural University	Community nutrition; food science and dietetics; tribal food and nutrition.	Strong support for student research; interested in possibility of commissioning work to Master's or PhD students.
Srinivas Chary	ASCI	Strategizing on improving services for the poor; urban governance; involvement of civil society and the private sector.	
N.V.N Nalini	Care	Development and implementation of health and nutritional programs for women and children, primarily in rural areas.	Scale-up existing rural health and nutrition programs to urban areas.
Dr. Mahendra Dev	Director, CESS	Agricultural development; poverty and public policy; food security; employment guarantee schemes; farm and non-farm employment.	Interested in research; communicate with other researchers in Institute that may be interested in working with us.
Dr. Ravi	CESS	Poverty, welfare, nutrition, and food security; involved in the Young Lives Project.	Link up with the Young Lives Project, already collecting anthropometry and nutrition data in two slums in Hyderabad.
Bhanwar Lal	Civil Supplies	Public Distribution System; initiated interesting program to fortify wheat flour available through fair price shops.	Explore possible connections with his new micronutrient initiative.
Harsha Vardhan	MCH	Community-based programs; community empowerment and skills training.	Support with entering slum communities and collaborating with their field workers; utilizing data they have already collected on slums; evaluating a new initiative on slum upgrading through public-private partnership.
Rama Mohan Rao	MCH	Health and sanitation; solid waste management; slum upgrading; private-public partnership.	
Ch. Janaradhan Reddy	MCH	Slum development; community-based programs	
Leena	Naandi	Design and implementation of school feeding program; partnership with various government institutions.	Interest in conducting an evaluation of their school feeding program.
Dr. Raghunatha Rao	NIN	Nutrition education for adolescent girls.	Very interested in being involved in long-term project; can provide expertise in the area of training and data collection.
Dr. Veena Shatrugna	NIN	Micronutrient deficiencies;	Interested in providing

		quantitative data collection; anthropometry.	expertise in the area of anthropometric measurements and data collection; collaborate with scoping study.
Dr. Shahnaz Vazir	NIN	Psychologist: research on child caring practices, behaviour change, monitoring and evaluation.	At the moment too busy with another project, but potentially available by middle next year. Consider replicating rural project on improved feeding and psychosocial care practices.
Subba Rao	NIN	Communication; nutritional education programs in schools.	Extremely interested in being involved on the communication aspects and in understanding policy processes.
Dr. Radha Krishna	NIN	Paediatrician; micronutrient deficiencies; zinc supplementation project in urban slums.	
Dr. A. Laxmaiah	NIN	Community nutrition; adolescent health	
Prof. Kodandram	Political Science Dept. Osmania University	Right-to-food; food security; food policy.	Interested in doing research on food policy in Hyderabad and the Public Distribution System.
Ali Asghar	COVA	Community-based programs; women's empowerment and skills training; community mobilizations; peace and social justice.	Learn from their expertise in working in communities in the Old City; link between our programs and their work on women's cooperatives.
Prof. Chowdry	Former Professor and Head at Agricultural Economics Dept.		Very instrumental in how to move the project further; has a lot of contacts in government, research institutions, and universities.
Priyanie Amerasinghe	IWMI	Bio-medical scientist	Link with water quality study in peri-urban areas of Hyderabad
Srinivas Reddy Srigiri	ICRISAT	PhD student at Humboldt University.	Suggested possible researchers at ICRISAT who may be interested in project.