



Research for the Sustainable Development of the Megacities of Tomorrow - Energy and Climate efficient Structures in Urban Growth Centres

Hyderabad as a Megacity of Tomorrow: Climate and Energy in a Complex Transition towards Sustainable Hyderabad – Mitigation and Adaptation Strategies by Changing Institutions, Governance Structures, Lifestyles and Consumption Patterns

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**ENVIRONMENTAL HEALTH RISKS IN
HYDERABAD IN THE CONTEXT OF
GLOBAL CHANGE**

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Analysis and Action for Sustainable Development of Hyderabad

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Environmental Health Risks in Hyderabad in the Context of Global Change

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Background Study

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Abstract

The paper uses quantitative and qualitative methods to assess livelihood patterns, changing lifestyles and urbanization in respect to their effects on the health status of citizens from slum and non-slum areas in the city of Hyderabad. Their linkages are embedded within the context of the progressing global change, especially emphasizing climate change impacts on health. This study does not only focus on the prevalent issues: International and national initiatives as well as health organization structures at the district level are explored, including preventive health care and alternate concepts by people to combat health crisis. The paper suggests undertaking several measures by governments on all levels also regarding regulations, but as well addresses the public to develop a stronger concern for their own health status. All in all a special focus on basic amenities, nutrition and health facilities is given.

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Glossary

Anthropogenic emissions	Emissions of greenhouse gases and aerosols associated with human activities. These include fossil fuel burning, deforestation and land use changes, resulting in an increase of emissions.
Fossil fuel	A natural fuel such as coal or gas formed from the remains of animals and plants (Oxford Reference dictionary 2001).
Green house gases (GHG)	Certain gases in the atmosphere absorb and emit radiation at specific wavelengths while the spectrum of infra-red radiation emitted by the earth's surface, the atmosphere and clouds, water vapour. Carbon dioxide, nitrous oxide, methane and ozone are the primary green house gases in the atmosphere. Moreover, there are a number of entirely human-made gases in the atmosphere, such as halocarbons and others dealt with under Montréal and Kyoto Protocols.
Green house gas effect	Greenhouse gases absorb infra-red radiation, emitted by the earth's surface and the atmosphere itself due to the same gases and by clouds. Atmospheric radiation is emitted to all sides, including downward to the earth's surface. Thus greenhouse gases trap heat within the surface-troposphere system. This is called natural greenhouse effect. Atmospheric radiation is strongly coupled to the level of the temperature at which it is emitted. An increase in the concentration of greenhouse gases leads to an increased infra-red opacity of the atmosphere and therefore leads to an effective radiation in to space from a higher altitude at a lower temperature

This causes radiative forcing, an imbalance that leads to an increase of the temperature of the surface troposphere system. This is called the enhanced greenhouse effect (WHO 2003).

Life Expectancy	The average number of additional years a person could expect to live if current mortality trends were to continue for the rest of that person's life. Most commonly cited as life expectancy at birth.
Infant Mortality Rate	The number of deaths of infants under age 1 per 1,000 live births in a given year.
Family Planning	The conscious effort of couples to regulate the number and spacing of births through artificial and natural methods of contraception. Family planning connotes conception control to avoid pregnancy and abortion, but it also includes efforts of couples to induce pregnancy.
Growth Rate	The number of persons added to (or subtracted from) a population in a year due to natural increase and net migration expressed as a percentage of the population at the beginning of the time period.
Health expenditures	Health expenditure covers the provision of preventive and curative health services, public health affairs and services, health applied research, and medical supply and delivery systems. However, it does not include provision of water and sanitation.
House	Every structure, tent, shelter, etc. was considered as a house irrespective of its use. It might be used for residential or non-residential purposes or both or might

even be vacant.

Household	One or more persons occupying a housing unit.
Incidence Rate	The number of persons contracting a disease per 1,000 population at risk, for a given period of time.
Infant Mortality Rate	The number of deaths of infants under age 1 per 1,000 live births in a given year.
Intergovernmental Panel on Climate Change (IPCC)	A group of experts established in 1988 by the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP). Its role is to assess the scientific, technical and socio-economic information relevant for the understanding of the risk of human induced climate change, based mainly on peer reviewed and published scientific/technical literature.
Life Expectancy	The average number of additional years a person could expect to live if current mortality trends were to continue for the rest of that person's life. Most commonly cited as life expectancy at birth.
Malnutrition	Malnutrition is a general term for the medical condition of a person caused by an unbalanced diet-either too little or too much food, or a diet missing one or more important nutrients. Most commonly, malnourished people either do not have enough calories in their food or their diet shows a lack of proteins, vitamins, or trace minerals.
Morbidity	Rate of occurrence of disease or other health disorder within a population, taking account of the age-specific morbidity/rates. Health outcomes include: chronic

disease incidence/prevalence, hospitalization rates, primary care consultations and Disability-Adjusted-Life-Years (DALY).

Primary Health Care

Essential health care that is technically valid, economically feasible and socially acceptable. Primary health care includes eight essential elements: education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; adequate supply of safe water and basic sanitation; maternal and child health care, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; and provision of essential drugs.

Percentage of infants immunized

The percentage of infants reaching their first birthday that has been immunized against each of the six EPI-target diseases (diphtheria, pertussis, tetanus, polio, measles and tuberculosis). The denominator used in the calculation is the number of infants surviving to age one.

Public-Private Partnership in health care

The Government of Andhra Pradesh has reorganized the comprehensive coverage of medical, police and fire emergencies through a public-private partnership Emergency Management Research Institute. The centralized helpline (108) is available for corresponding emergencies.

Total health expenditures

Annual national health expenditure as a proportion of the GDP. The value of the sum of public and private expenditures on health care goods and services for a

given national economy, at a given period of time,
usually a year, expressed as a percentage of the
corresponding gross domestic product (GDP)

Executive summary

- The anthropogenic or human-induced actions which are associated with the processes of industrialization, urbanization, migration and globalization causing global climatic change are: construction of factories and concrete buildings, reshaping of natural hills, filling valleys, wetlands, killing of animals, elimination of natural species of flora and fauna, changes in fertile agricultural areas in order to create “built natural environment in urban areas”.
- Hyderabad is the 43rd fastest growing city in the world. On the other hand the paradoxical development of the city’s growth in certain parameters is contrary to the little progress in human development.
- The urbanization process in Hyderabad has a direct bearing on the infrastructure facilities and basic amenities like water, sanitation, sewerage and housing; food security; residential and work environment. In addition there is an increase in pollution with rapid urbanization. Both together has a detrimental effect on people’s health. The present study is based on evidence and empirical research that attempts to look at the relation between environmental health risks in Hyderabad and the context of global change.
- The survey covered four areas in the city by a random sampling method; in total 200 households were interviewed. In addition to quantitative analysis, qualitative inputs were collected to gain insights into environmental health issues. This was carried out with focus group discussions and in-depth interviews.
- The study population has a well representation of people by age, social categories of caste, class, and gender. The wealth index of households indicates that the sample represents 26% as high income, 56% as middle income and 18% as low income groups.
- Educational status of the study reveals that nearly 14 out of every 100 persons are non-literate; on the contrary 31 out of every 100 persons have studied up to graduation or above. This contradictory situation indicates the diverse category of population in the state capital of Hyderabad. Of the remaining literates almost 10% had a primary level of education, i.e. 1-5 years of formal schooling, 29% obtained 6-10 years and around 15% completed 11-12 years of formal schooling.
- Three-fourths of the respondents are not originally from Hyderabad but migrated to the city more than one or two generations ago from coastal areas of Andhra Pradesh in search of employment, business or for livelihood.

- 75% of the households live in pucca houses, the remaining in kutchha or huts. Some houses are built near sewage canals that might even flood when little rainfall occurs. Leakages in the roof are a common experience. Often, the marginalized people, living in the slum areas of Gandhinagar, the old city and Pathancheru, complained of water-borne diseases and foul smell in the surroundings. Chikenguneya, typhoid and fevers are common.
- 10.5% houses are built on unauthorized land. These houses lack proper drainage facilities and hence, during all seasons except summers the stagnated water offers a breeding ground for mosquitoes causing malaria. Amoebiasis, dysentery and gastroenteritis are common complaints of most of the people particularly children and elderly throughout the year.
- Nearly 5% of the houses do not have authorized power supply. 43% of houses do not have separate kitchens causing indoor pollution and women and children are prone to suffer from asthma and other allergies.
- Nearly one fourth of the houses do not have at least one window per room missing natural lighting and fresh air flow.
- 26% of the households are not provided with piped water, 82% do not receive daily water supply, and if so, the supply is on alternating days. Nearly 14% do not have access to potable water. In some areas water is contaminated with chemicals (accounts for 5% of the studied population) or they obtain sewerage water (3%). A small percentage of fluoride contamination also prevails. In the areas of Jedimetla, where houses are constructed near pharmaceutical factories, people obtain contaminated water through bore wells. 3.5% receive water without chlorination. People living in slums of Cyberabad have to walk 10 km to get water for cooking purposes. Water inequity in supply is distinctive by class; experience of shortage is according to the wealth index.
- Nearly 85% of households do not use any adequate measures to purify water. Only 15.5% take advantage of boiling or using the electric purifier.
- Many people in slums store water without a lid that allows mosquitoes to breed and thereby spreading diseases.
- 26% do not have proper drainage facilities for kitchens and the same accounts for washrooms with 9% of households. These figures indicate that poor people do not pollute the environment to a great extent.
- 16.5% have an open drainage facility and 1.5% show leakages in the closed drainage systems. 11% of households use shared toilets that are injurious to health. Less than 1% do not have toilet facility at all.

- 63% of households suffered from one or more illnesses during the past one year. Typhoid, malaria, jaundice, gastroenteritis and breathing problems are the most common diseases, although to an extent preventable if caring for environment and sanitation.
- Lack of amenities, housing, safe water and sanitation in poorer sections of the city cause water related diseases such as jaundice, viral fevers and mosquito related typhoid, chickengunya, malaria and other fevers as well as air polluted diseases like asthma, skin allergies, lung infection and other infection diseases. There are clear indications that these disease patterns will further spread in the context of climate change.
- The present study also deals with lifestyles and explores the causal factors relating life style, work-pattern/pressure and adaptations to changes in the environment that affect the health of the population.
- Conventional wisdom says “Eat like a king in the morning breakfast, eat like a common during lunch and like a poor man for supper”. This is to remain good health, to have energy during productive hours of the day and to go to bed with light weight. In rural areas people consume food suited to seasons, and traditional and natural available foods are taken to keep them healthy. The urban styles have changed food patterns of all classes. The poor skip breakfast to save time and money. The affluent classes skip their food due to work tension. Beverages replace healthy meals in the morning. For lunch some go to hotels and consume unhealthy fast-foods. Evenings or nights are the relaxed hours often spent with watching TV and having dinners together with the family. Consuming more food during dinners and having less sleep is adversely affecting one’s health. These habits have led to a vicious circle of lack of time in the morning with less or no breakfast, an unhealthy lunch combined with work pressure, over eating at dinner and relying on TV as an entertainer and ends with forgoing of sleep; All of this has been detrimental to general health.
- Empirical findings reveal that 76% are taking only tea or coffee for breakfast, 64% shifted from traditional meal to other types, while only 46% take idly or puree as specific breakfast. Nearly 3% consume junk food that affect their health and early 87% skip breakfast at least once a week. Out of them almost 67% miss it due to work pressure; late night work, no time or appetite. Of course, nearly 3% cannot afford to have breakfast.
- One study on changing food habits of migrants shows that 2.5% take fast foods for breakfast, 6.5% shifted to fast foods/hotel foods for lunch. 38.5% take fast foods and 19% take soft drinks between the meals.
- 60% of the elderly expressed that they feel the food they consume is not adequate for them.

- Irregularity of food intake associated with missing breakfast and preference for fast foods (non-nutritive) are found to be linked with fatal cases in the study. During focus group discussions women, belonging to the middle class, in some cases confessed that they lost their husbands due to cardiac arrest. Non-communicable diseases like diabetics, cardiac arrest, and high blood pressure have become common in the younger and middle age groups (35-50 years of age), earlier it was perceived to be associated with elderlies who were 60 years or above.
- When asked about addictions, 91% realized watching television is an addiction and has been disturbing one's daily schedule. 5.8% of the interviewees are habituated to chew pawan, 6% take gutka, often the leading cause of oral cancer and throat infections. 12% consume alcohol. Some people, working on night shifts at call centres, are prone to road accidents by drunken cab drivers.
- Reasons for the addictions according to the households are related to work pressure (11.5%) and to city life/culture (25.6%).
- Accessibility of health care is an essential requirement. Given the improvement of health budgets and alternate measures adopted from time to time during various plan periods, yet the health care system is not able to provide accessible health care facilities to all. 7.5% do not have health facility within a reach of 2 km distance from residence. More than half of the households (54.5%) depend on private health care facilities, only one-fourth (27%) depend on public health facility. 12.5% are going to quacks and 5% do not know where to go for health care. Nearly one-tenth feel health care is expensive.
- In summer, dysentery is especially affecting people in slums. Per day at least 10-15 cases are registered at the Government Fever Hospital.
- Despite having conventional wisdom of adaptive measures to face extreme weathers/climatic conditions, with urbanization people have shifted away from these mechanisms. In summer people used to consume butter milk/ragi water, now the urban style promotes carbonated cool drinks. Children are not being taught anymore to eat natural fruits, working parents rather encourage them to take canned juices or aerated drinks.
- Along with changing life styles in a globalizing world, changing food and eating patterns have evolved.. While upcoming middle classes were able to change their food intake patterns and to bring quality and taste to their food, poor people continue to suffer from food insecurity, hunger and diet related malnutrition. At the same time the changing food culture in hotels, pubs, festivals and ceremonies is also leading to a higher carbon foot print.

- Less than half of the households goes for preventive health check-ups. Relatively more men (40%) than women (27%) go for preventive health check-ups and more children are provided with preventive health check-ups.
- Many women from middle class families are not able to take care of their health due to domestic and work pressure.
- Care for occupational hazards for factory workers is corrupt in several cases, though private management exists; the number of construction workers is severely decreasing due to illness/injury and death in the city of Hyderabad.
- The fastest growing city is in a paradox of development in the changing global situation without demographic dividend, particularly of health.

1 Health-Environment-Urbanization: An Introduction

“Climatic change policy is not a simple choice between a high-growth, high-carbon world and a low-growth, low-carbon world; a simple question is whether to grow or preserve the planet...Many mitigation actions - meaning changes to reduce emissions of greenhouse gases - have significant co-benefits in public health, energy security, environmental sustainability and financial savings” (World Development Report 2010)

Impact of environmental changes is witnessed by the green house effects, glacier melting, floods and other occurrences at the global level. The urban population faces different environmental issues that badly affect the health of all people in a certain way, and more particularly this has greater impacts on the socio economic deprived nationalities and groups.

According to the World Health Organization (WHO) “Health is a state of complete physical, social and mental well-being and not merely an absence of disease or infirmity”. Though environment describes the natural conditions e.g., land, air and water in which people, animals and plants live (oxford dictionary), the term embraces more than that when relating to health. Therefore, the WHO (2008) defines environmental health as “all the physical, chemical and biological factors external to a person, and all the related factors impacting behaviours. It encompasses the assessment and control of those environmental factors that can potentially affect health. It is targeted towards preventing disease and creating health-supportive environments” It is basically through physical health that a person is able to pursue comprehensive development of the self and the society as well as other aspects of life. However, good health is directly related with the quality of food, basic amenities as water, sanitation, house,

environment and health care facilities. Health is increasingly recognized as a critical human capital component and only healthy and educated population can contribute to productivity and human development (Sharma 2006, in his foreword to Prasad S. and Sathymala (Eds.) 2006). For instance, in the 1950's, sickness due to malaria restricted farm work and productivity in Punjab, India. In the 19th and 20th centuries, Britain's income can be attributed to good health and nutrition; and moreover, the present distribution of AIDS in Africa has devastating impacts on the economy (Naryan 2006). As the proverbial saying states 'health is wealth', an estimate of WHO (2005) holds that India's loss in national income due to heart diseases, stroke and diabetes was US \$ 9 billion. Projections for the decade 2005-2015 held that owing to deaths due to cardiovascular, stroke and diabetes, India will lose US \$ 23 billion annually (Abegunde and Stanciole 2006 in Chada et al. 2007).

Urbanization is a natural process of modernization and rapid population growth. Due to changing times and needs, people migrate from rural to urban areas. Cities are expanding by encroaching interior parts of city and even rural areas. In order to protect themselves from natural disasters like floods, fires and earth quakes urbanites build flood walls, dams, earth quake resistant buildings and storage places for food and water. Recent changes in the global-social environment are in fact changes we find in human being's life since industrial times. Man moved away from nature and lived in a "built natural environment" (Ann Spirin in Tarr n.y.) by changing natural land areas, water systems, hills, valleys and forests to accommodate many people and to fulfill their growing needs of automation and artificial life. Thus, city environments have to suffer from increased pollution loads as well as they have to cope with industrial production, market and population (Tarr n. y.).

World urban population projections show that from 2009 for all 281 urban areas population is expected to reach 2,000,000 by 2030. Presently urban areas with a high populations of more than five millions inhabitants are renamed as mega cities and metropolitans. A metropolitan area includes substantial rural territory or area, which shows discontinuous urban development. For example a large part of the municipality of Mumbai is rural, composed of the Rajiv Gandhi National Park. Mumbai ranks the 4th largest urban area in the world with 20,400,000 people while Delhi ranks 6th, Kolkatta ranks 12th, Chennai ranks 37th and Hyderabad ranks 43rd (Demographia 2009).

Due to over-crowded populations, improper city planning, lack of basic amenities for instance water, sanitation, housing, and planned public transportation and with too many private vehicles, urban lives all over the world is deteriorating. Apart from common communicable diseases like malaria, diarrhea, viral fevers; urban life style causes specific respiratory infections, cardiovascular diseases and so on. In addition, tension, stress, work-patterns, eating disorders cause diabetes, digestive, gentio-urinary diseases and some abnormalities, which are not communicable. On the one hand people living in slums are

deprived of civic amenities and prey to communicable diseases that often become fatal. On the other hand, costs of medication for cancer and cardio-vascular diseases pushes even middle income groups into poverty. With these urban scenarios, a sense for sustainable urban development as an integration of equity in development and sectoral sections across space and time (Cruz et al. in Chattopadhyaya, 2008) and as a balance between environmental protection and human development and between the present and future (Chattopadhyaya, 2008), is now of utmost concern. Sustainable urban development takes care of proper provision of basic amenities, food security, transport facility, housing and above all health hazards specific to urban environment; for example vehicular pollution, solid waste and sewerage.

2 Environmental Health Risks in the Context of Global Change: An Understanding Based on Literature

2.1 Globalization and Induced Climatic Change: Impacts on Health

Climatic changes occurred naturally over decades. “Climatic change is a long-term shift or alteration in the climate of a specific location, region or entire planet and it is measured by changes in some or all the features associated with average weather such as temperature, wind patterns and precipitation”(Shukla et al.2003). It is due to continental drift, various astronomical cycles and variations in solar energy output. Some of the natural climatic changes in fact are beneficial for human health. Climatic changes in seasons are not only beautiful but do not affect human health in an adverse pattern. For example milder winters help people in temperate regions to work without facing fatigue; and further increases in temperature in hot regions reduce the viability of disease-transmitting populations.

The present changes in climate are not just natural but as well induced by human actions that are explicitly and implicitly responsible for increased sea levels, environmental pollution and diminution of natural resources as water, land, greenery and air. Of course, since the 18th and 19th centuries, the phenomenon of globalization was present in a way. However, globalization of recent times not only facilitates trade and communication but also competition among nations to flourish through industrialization and urbanization.

Today, globalization refers to the increasing integration of economies around the world, particularly through ‘trade’, ‘production chains’ (where parts for a final good, such as an automobile, are produced in one country and assembled in another), and ‘financial flows’ (Bhargava 2006). In the 16th and 18th centuries in form of “Proto-globalization”, a social change is regarded as an increased connectivity among societies and their elements due to transculturation through the explosive evolution of transport and communication technologies. This term is first introduced by the historians A.G Hopkins and Christopher. It is marked by trade arrangements such as the East-India Company and the shift of the hegemony to Western Europe, the rise of large-scale conflicts between powerful nations and slave trade, taking advantage of resources within the western hemisphere, the transfer of plant and animal crops and epidemic diseases associated with Alfred Crosby’s concept of the Columbian Exchange. It involved a vast group including European, Muslim, Indian, Southeast Asian and Chinese merchants, particularly in the Indian Ocean region. A transition from proto-globalization to modern globalization in the 19th century was marked with a more complex global network based on both capitalistic and technological exchange; however, it led to a significant collapse in cultural exchange.

The process of globalization caused division of nations into high income and low income based on the nation's effective use of trade, finance, communication systems, mobility of people and intellectual constructs. Modern globalization influenced the interdependence as well as nation states' sovereignty, leading to new global governance (Huymen et al. 2005). While the high-income nations developed through industrial achievements, the low-income nations not only learnt lessons from the political imperialism of these nations but also imitated their industrial development for their economic survival. As a result, all the nations contributed through 'human actions' for ecological imbalance and adversed/induced global climatic changes.

The anthropogenic or human induced actions which are associated with the processes of industrialization, urbanization, migration and globalization are: construction of factories, concrete buildings, reshaping of natural hills, filling valleys, wet-lands, killing of animals, elimination of natural species of flora and fauna, changes in fertile agricultural areas in order to create "built natural environment in urban areas" with water supply and land area for urban life. Induced human action, especially "urban action" as a source of pollution and environmental health hazards include: discharge of sewage, industrial waste into neighboring water ways, discharge of smoke from industries. Use of polythene and plastic and many vehicles are factors for major pollution as well. Some other urban traditions causing environmental pollution include the use of many electrical appliances as refrigerators, washing-machines and other goods. These anthropogenic (human caused) actions enhance the green house affect and thus global warming. Emissions associated with land- use changes, deriving from agriculture fertilizers, livestock, deforestation, and burning of fossil fuels burning energy, account for about 30% of the total green house gas emissions (WDR 2010). high-income nations with one sixth of the world's population are responsible for nearly two-thirds of emitted green house gases. Low-income nations' average per capita emissions account for a third of those from high-income countries (World Bank 2010).

The very high concentration of global deaths from extreme weather-related disasters is counted in low and middle-income countries (UN Habitat, 2007 and UN, 2006 in Satterthwaite, 2008). Africa, which was long considered as a predominantly rural continent, has a larger urban population than North America. Low and middle income countries have the world's largest share of (three- quarters) of urban population. China and India alone are home to more than a quarter of the world's urban population and the world's largest population within Low Elevation Coastal Zones (LEZS: less than 10 meters above the sea level). 13% of the urban population (around 30 million people) lives in the LEZ areas. 10 million people each year are affected by coastal flooding. The Intergovernmental Panel on Climate Change (IPCC) Working Group II Report held that population in Asian deltas as Ganges-Brahamaputra (that includes Dhaka),

Shanghai, Bangkok and many other deltas in Asia are particularly vulnerable due to sea-level rise (Nicholls et al. 2007 & Revi 2008).

India (Gujarat and Orissa) and Vietnam are at high risk regarding hurricane-force (Agarwal and Lal 2001). Due to the density of the population, the air pollution in urban areas is high and a diurnal cycle of absorption and later re-radiation of solar energy takes place. This process causes severe heat-stress that affects human health. North America, Asia and Europe are with highest levels of air pollution and heat waves. Furthermore, studies in North America, Asia and Europe found heat waves to be associated with short-term increase of mortality (Confalonieri et al. 2007). In Andhra Pradesh heat waves caused more than 1000 deaths only in 2006 (Revi 2008,). Reduction in fresh water-supply due to climatic change is foreseen in Central, South, East and Southeast Asia affecting more than a billion people by 2050 (Adger, Agarwal, Agrawal et al. 2007). Many cities, particularly growing cities, and their water catchments will get less precipitation causing stronger constraints for fresh water sources (UN Habitat 2006). These induced climatic changes directly impact the health of people (see figure 2-1).

Some research findings on the impact of climatic change on health in India found that exposure to extreme cold or heat, solar radiation, high humidity are affecting human/physiological mechanisms of adaptation and causing illness. Mortality may increase more with rising than with falling temperatures (Kalkstein, 1993, Shukla 2003). An increase in vector borne diseases as dengue fever, malaria, kala-azar, filariasis, Japanese encephalitis due to changes in the temperatures with the availability of a suitable habitat for the insect or parasite, is likely to be another impact. A spread of food poisoning and water borne diseases is also found due to greater chances for survival of aquatic pathogens. An increased sea level also causes infections due to washed out algal bloom into fresh water sources (IPCC 1998A rise in sea level and changes in agricultural production too can cause nutritional health effects).

Figure 2-1: Induced global climate changes: effects on environment and human health

- Global climate change due to accumulation of green house gases in the lower atmospheric zone (stratosphere) causes ozone depletion that leads to higher skin cancer rates, cataracts, and perhaps to immune system suppression.
- Change affects natural biodiversity where useful species and genes disappear. Various ecosystems that support biological life would weaken.
- Desertification process results into the depletion of fertile soil, ground water and natural fisheries that in turn affect food-producing eco-systems.

- Chemical pollution of the atmosphere affects neurological immune and reproductive systems. (WHO, Bank 2000).
- Climate change causes major tropical vector-borne diseases.
- Due to combined effects of rapid demographic, environmental, social, technological, and other changes in ways of living new-circulated diseases we find are: HIV/AIDS, hantavirus, hepatitis C, SARS (WHO 2003).
- Due to international travel and commerce, certain diseases as airport malaria, mosquito vector, cholera etc. are spread (WHO 2000).

Source: WHO 2000, 2003

Other health effects include temperature related morbidity, malnutrition and hunger, especially concerning children. Most effected people are the poor, children, senior citizens, chronically sick and disabled persons; people living in over-crowded city quarters and poorly served settlements of rural and urban areas. Climatic disasters are associated with the displacement of especially poorer sections causing social distress and mental health stress (Shukla et. al.2003).

2.2 Approaches, Issues and Initiatives on Environmental Health

Environmental health relates to human activity and environmental factors that have an impact on socio-economic and environmental conditions with the potential to increase human diseases, injuries and death, especially among vulnerable groups - mainly poor, women and children under five years (Listorti and Doumani 2001; Lvovsky 2001; World Bank 2008). A study on environment includes not simply natural resources; land, soil, water and forest resources but is also related to indicators of live stock, fisheries and coastal resources; mines and minerals. Hence, environment and its relation to health need to be studied through indicators like people's access to safe drinking water, sanitation facilities, indoor pollution and urbanization. The quality, quantity and distributional aspects of the physical environment or natural resource base are critical for any kind of development. Recent studies on environment deal with two dimensions: natural resources and status of environmental health. Thus, the indicators generally used for natural resources are per capita availability of cultivable land; per capita availability of common property resources; proportion of under-utilized land and proportion of degraded land to total cultivable land. Further indicators for environmental health are proportion of households without tap water, households without sanitation facilities and households using soil fuels for cooking. Environmental factors account for 22-23% of diseases in rural areas and for 18-19% of urban diseases (Go AP and CESS 2007). Environmental health problems like pollution of water or pollution due to biomass fuel are traditional

(World Bank 2001, Govt. of AP and CESS 2007) and approaches to environmental health are as well known since generations. However, today we have urban specific environmental health hazards, such as stress, eating disorders, electronic waste, sewage problem, vehicular pollution and so on.

2.2.1 Approaches on Health

The history of approaches on environmental health by the World Bank (2008) deals mainly with four approaches; the first generation approach called “Miasma Theory” where the source of disease is attributed to bad odor in early Greece. Late Romans used great sewerage systems, fresh water supplies, proper ventilation, toilet facilities (Rosen 1958; World Bank 2008). Later in the 19th century, English sanitary reforms continued with the Miasma theory. The health sector focused on access to water, sanitation and inspection of food (World Bank 2008). The second generation concentrated on vaccinations (e.g. after Louis Pasteur invented the germ theory and multisectoral inventions. Multisectors include chlorination of water, pasteurization of milk, vaccinations, improvements of food safety and vector control (Berg 2005, World Bank 2008). Third generation health care includes environmental health by scaling up rural health, community based health approach by sending nurses to homes, health awareness creation by controlling infectious diseases through scientific techniques by 20th century (World Bank 2008). The fourth generation by the middle of the 20th century focused on institutional frameworks to regulate environmental health issues, where different agencies were involved (Berg 2005 in World Bank 2008). There was a rise in ecological awareness; concern for environmental exposures as factory emissions and emergence of environmental laws (Kotchian1997 in World Bank 2008). Also there was lot of investments in health and increase of hospital beds (Lvovsky, 2001, in World Bank 2008).

2.2.2 Issues on Health

Health is not an aspect that can be dealt within isolation. It is a complete and encompassing aspect where each human aspect affects man’s physical and overall well being; more so wellbeing of everybody is only possible in a welfare state with good partnerships at state level and international level. Thus, issues on health are many to deal with and are embracing such as infrastructure facilities, basic amenities (water; sanitation, sewerage and housing); natural resources; food security; residential environment; literacy/educational levels; work environment; pollution (environment/vehicular pollution; polythene use solid waste); affordability of health care and medicines and preventive health care. Furthermore, research on health requires more attention to deprived groups based on caste, class, gender, age and so on.

Starting with urban growth, it is to state that Indian cities are already characterized by a high density of population (Chattopadhyay 2008). As per census 2001, urban population accounts for 27.8% of the total population equating to 285 million. Population projections indicate that by 2025 India’s urban

population will grow up to 660 million with more than half of the total population living in urban areas. India's average growth rate is 2%, for urban India it accounts 3%, mega cities show a 4% rate and slums 5% in the last decade (Agarwal 2005). The estimated Indian population by 2025 is 1,396,046,308.

Furthermore, urban slums present a very specific issue when it comes to health. Poor people live in slums, which are over-crowded, often polluted and with lack of basic civic amenities like clean drinking water, sanitation and health facilities. Most of the inhabitants are involved in informal sector activities, where there is a constant threat of eviction, removal, confiscation of goods and almost non-existent social security cover (Radha. R. Chada May 2009). Half of the slums (50.6%) are notified (GOAP and CESS 2008). A study (Agarwal 2009) on slums in India found that slums constitute 19.9 % poverty (NSSO 1999-2000). One-fourth of slums and squatters (26%) do not have arrangements for garbage disposal (GOI 2002). Poor environmental conditions in slums account for a high population density and cause vulnerable diseases like asthma; tuberculosis (TB); vector borne diseases (VBDs) like Malaria and so on. Nearly 30% of the population in Hyderabad lives in slums (Prasad and Ramachandraiah 2008).

Figure 2-2: Growth of urban slums

As per census 2001, 286,000,000 people lived in urban areas; it is estimated that the urban population of the country will increase to 432,000,000 by 2021. It also resulted in the growth of urban poor population, especially those living in slums. Slum population accounted for 373,000,000 is expected to increase by 2007-08 (projections for 2008 based on 7% annual growth rate for slum population).

Source: Census of India, 2001, Registrar general of India.

As per NSS (1999-2000) estimates, Uttar Pradesh, Rajasthan, Bihar, Orissa, Jharkhand, Chhatisgarh are the states with 28 million or 43% of urban poor (Agarwal 2005). Urban poverty ratio in AP is higher with 28.0% while the urban poverty ratio for national level is 25.0 for the year 2004-05 (GOAP and CESS 2007). This poses the problems of housing and shelter, water, sanitation, health, education, social security and livelihoods along with special needs of vulnerable groups like women, children and the aged

Another major issue is pollution, which causes more than 1.6 million deaths per year (World Bank 2008). Noise pollution is due to heavy traffic, commercial and industrial activity. Vehicular pollution has been increasing at rapid levels. Even though in India the number of vehicles used per every 1000 population is only 12; very low as compared to the US (the corresponding number is 765), its contribution to pollution is rising steeply (Enadu, 2009). Indoor pollution, leading to respiratory infections, is well proven. In many developing countries including India, the governments took measures to promote

improved kitchen facilities or smokeless chullas under rural developmental schemes. In Eritrea the government promoted improved kitchen and household ventilation to prevent respiratory infections through indoor pollution (World Bank 2005, 2008).

Another impact on health is due to radiation. Employees of the National nuclear fuel complex (NFC) complain that they are exposed to radiation and suffer from health problems like skin irritation; Skin cancer, blood cancer, genetic mutation and birth defects on the offsprings through safe guards are provided. No evidence about the leakage is found (Deccan Chronicle 2009).

Furthermore, basic amenities like water, sanitation and housing are pre requisites for human health. These include supply of drinking water as well as for utility, proper sanitation facilities, housing quality and transportation facilities. Nearly 1.1 billion in the world are in lack of safe drinking water (World Bank, 2008). Only 69% of households have safe drinking water in India. 40% of the world's population is lacking basic amenities (Ganesh Kumar and Jayarama 2009). People are cutting down on their usage of water quantity; the percentage of households using only 100 liters per day is 37% in Hyderabad; 31% in Mumbai; 24.7% in Kanpur; 30.7% in Madurai, 52.9% in Calcutta. Furthermore, 70% of Indians depend on tap water; 21.1% on bores; 6.7% on well water (World Bank. Hari Prasad Reddy 2009). Within the period of the last five years, the percentage of households using piped drinking water has come down by nearly 7% in Hyderabad. According to WHO/UNICEF an improved source of drinking water includes water piped into dwelling/yard/plot, water available from public tap or stand pipe or a tube well or borehole, or a protected well or spring.

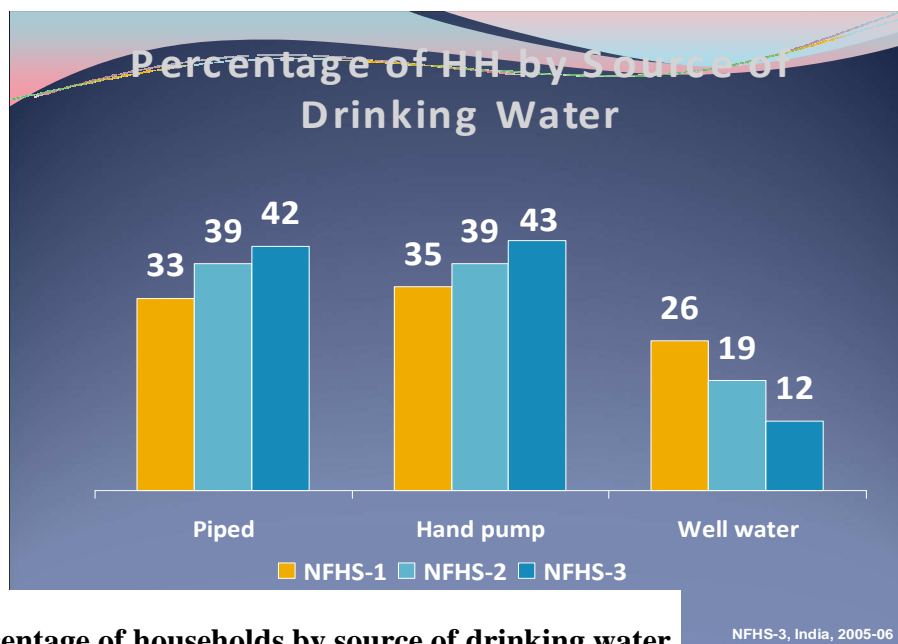
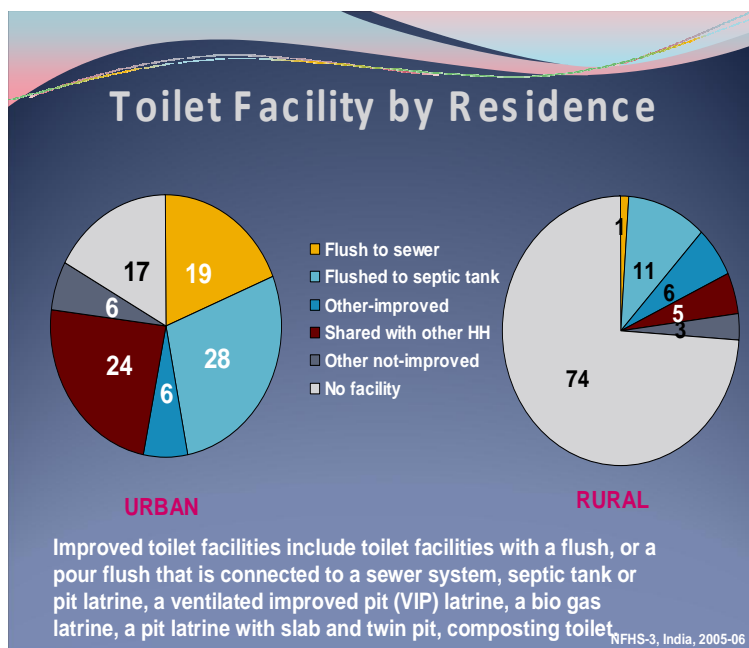
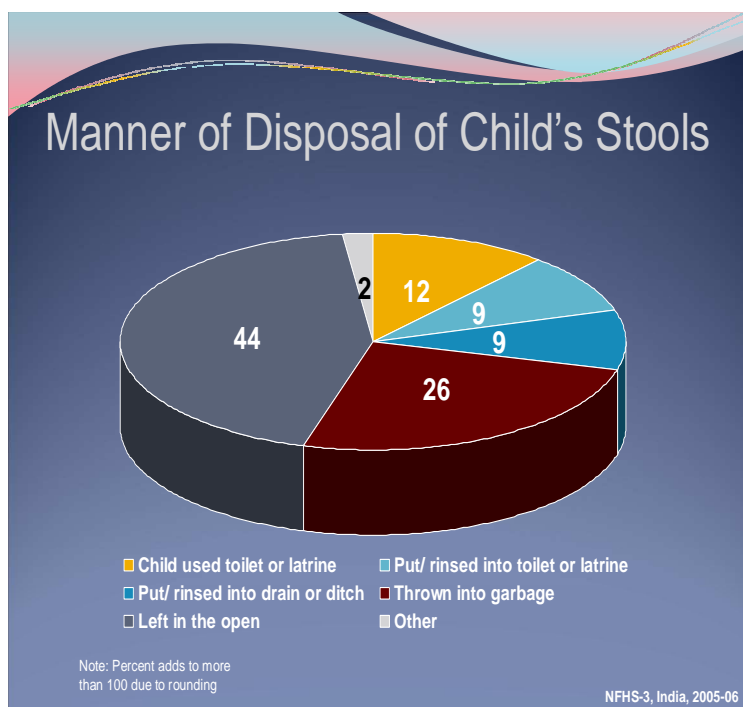


Figure 2-3: Percentage of households by source of drinking water

Hasan's field study (2008) on major cities found the share of households considering water supply for domestic consumption in Hyderabad is only 49% and percapita consumption is 96.2 liters. Further intra-city inequity continues to be an issue. People in poor areas are victims to waterborne diseases. Research conducted on an empirical level found that the Musi river is polluted by domestic and industrial waste impacting river ecology and the health of people (Ramachandraiah et al. 2007). In Hyderabad, diarrhea and viral pyrexia/fever are related to lack of clean drinking water, poor sanitation and low resistance (Sheela and Ramachandriah 2007 in GOAP and CESS 2007). Therefore, a proper sanitation facility is a pre requisite for a satisfactory state of health. The Millennium Development Goals (MDGs) define sanitation as "Connection to public sewer, connection to a public system, pour flush latrine, simple pit latrine or ventilated improved latrine." 2.6 billion people in the world are without sanitation (World Bank 2008). As per census 2001 for India, only 61% had latrine facilities in their houses and 35% closed drainage facilities. As per ISI, for each house that has flush facilities in mega cities, 200 liters water per use is supplied.

Figure 2-4: Manner of disposal of child's stools



Source: NFHS-3, 2005-2006

Figure 2-5: Toilet facility by residence

Concerning the excreta disposal system, it is considered adequate if it is private or shared (but not public), and if it hygienically separates human excreta from human contact” (Ganesh Kumar and Jaya Rama 2009). Nearly 74% of rural and 17% of urban households in India did not have toilet facilities in 2005/2006. In Hyderabad still 3.3% do not have access to toilets neither within the household nor as a shared facility. In only 12% of households children use toilets and in 9% of households either put/rinsed in toilet. In 44% of the households, child’s stools are left in the open.

Andhra Pradesh has maximum number of cities/towns (77) reporting slums among all states in India. Andhra Pradesh accounted for 14.9% of the slums in India. In Andhra Pradesh 82.7% are notified slums as compared to 50.6% at the all-India level. The majority live on public lands, about 60% of the notified slums and 71% of the not-notified slums. While 87% of notified slums have tap water facility, only a percentage of 46 is observed in not-notified. Water logging is another problem for both the areas; 37% for notified and 69% for non-notified (GOAP and CESS 2007).

Regarding public health service, the public opinion in Hyderabad goes adversely. Hyderabad recently attacked by diseases like dengue; swine flu and other seasonal diseases, that are mostly rooted in environmental pollution, factory pollution, bad working of sewage and sanitation; overflowing canals, contaminated water due to leakages in drinking water pipe lines especially in the slum areas. In general, the public opinion goes against the ruling government. 65% of health centres are not provided with proper funds from the government (Enadu, 5th November 2009). Additionally to slums, housing is another issue for health. Records in Andhra Pradesh tell us that by 2001 (Census), there were 1,540,000 or 40.7% of the population houseless, i.e. 68,000 people or 2% of the total urban population was houseless. Only 8% of total beneficiaries of housing schemes are from urban areas (GOAP and CESS 2007).

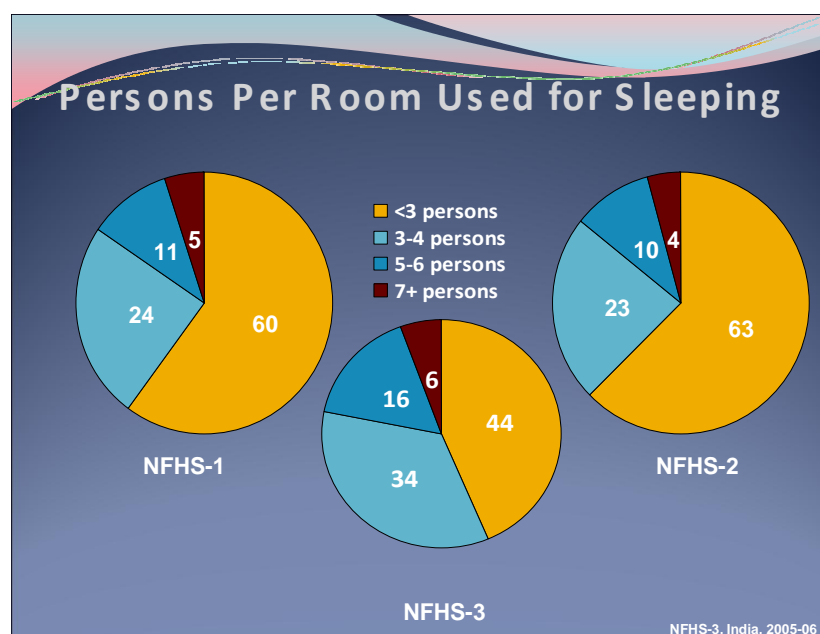
As per census 80% of urban households in the country and almost everyone in Hyderabad (99.3%) are with electricity. Poor Housing is a determinant to health. A little more than one-quarter of the households in Hyderabad does not live in pucca houses. The World Health Organization (WHO) defines, “The term housing can be defined as the residential environment, neighbourhood, micro-district or physical structure that mankind uses for shelter and environs of that structure, including all necessary services, facilities equipment and devices needed for the physical health and social well-being of the individual” (Rao, 2002). Bryant (2002) held that homeless population experience much greater incidence of negative health conditions; people who live in hostels, day centres and soup runs were more likely to have musculoskeletal and chronic breathing problems, headaches and seizures (Bines 1994 in Bryant et al. 2000). Bryant et al. (2002) also argues that individuals, who are forced to spend a disproportionate amount of their income on rent often face food insecurity and possible malnutrition, leaving little money for clothing, transportation and for any kind of recreation.

Table 2-1: Basic amenities

Es konnten keine Einträge für ein Abbildungsverzeichnis gefunden werden.			
Basic amenities in Hyderabad regarding households	DLHS-3 (2007-08) %	DLHS-2 (2002-04) %	
Piped drinking water	91.6	98.2	
Access to toilet facility	96.7	95.9	
Electricity connection	99.3	97.4	
LPG for cooking	84.9	73.3	
Shelter in pucca house	72.3	74.1	

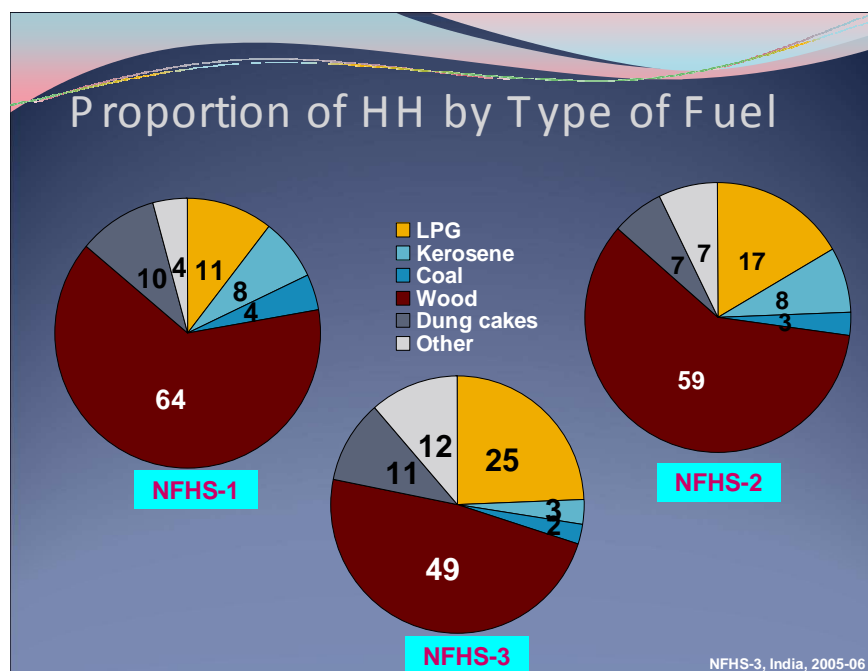
Source: District Level Household and Facility Survey under Reproductive and Child Health Project (DLHS-3; 2007-08), Ministry of Health and Family Welfare, Government of India as cited

According to NFHS-3, 7% of people share one room when the household counts 6 or more persons. Half of the population are required to share with 3 to 6 person one room. Still, half of the households in India are dependent on wood as the main source of fuel for cooking; barely one-fourth of them are using LPG. The situation is though better in urban areas, still 15 % of the residents in Hyderabad do not use LPG.

Figure 2-6: Persons per room used for sleeping

Source: NFHS-3, 2005-2006

Figure 2-7: Proportion of households by type of fuel



Source: NFHS-3, 2005-2006

Coming to transportation, the National Transport Policy of India 2006 recommended non-motorized-transport. In Delhi walking and cycling are more common than in Mumbai and Calcutta. In fact, lack of good public transport resulted also for the use of private cars; resulting in higher carbon emissions (Chattopadhyay 2007). Recently, the Hyderabad Transport Corporation introduced air-conditioned bus services on some routes, yet its role in facilitating the services for the public vis-à-vis emission of carbon needs a detailed investigation.

Health is also connected to life styles. When life styles changes disease profiles also are likely to be impacted. Disease profiles in urban India show transitions from communicable to non-communicable diseases; a transition from infectious to life style diseases and from white to blue collar diseases. The causal factors for the changing profiles are different and related to the nature of job, the urban lifestyle associated with tension, stress, eating disorders, excess leisure or lack of exercise. An overall change from 'rural and less mechanized base' to an 'urban and automated development' is the chief cause for changes in life styles. Mishra (2005) appropriately relates life style diseases to having no control over DATES, where D stands for diet; A for alcohol, T for tobacco; E for exercise and S for stress. While liberalization of economy expanded opportunities for employment and additional incomes, it also brought urbanization and changes in lifestyles.

According to NFHS-3, tobacco and alcohol are the important risk factors for morbidity and mortality among adults. Studies associate alcohol use with accidents/injuries and violence against women. Tobacco and alcohol use by women, especially during pregnancy, is a matter of concern since it entails serious reproductive risks. While only 11% of women consume tobacco, this is also valid for nearly 1 out of 10 pregnant and breastfeeding women. Among women who smoke, more than 9 out of 10 smoked at least one cigarette/bidi in the past 24 hours, according to NFHS-3.

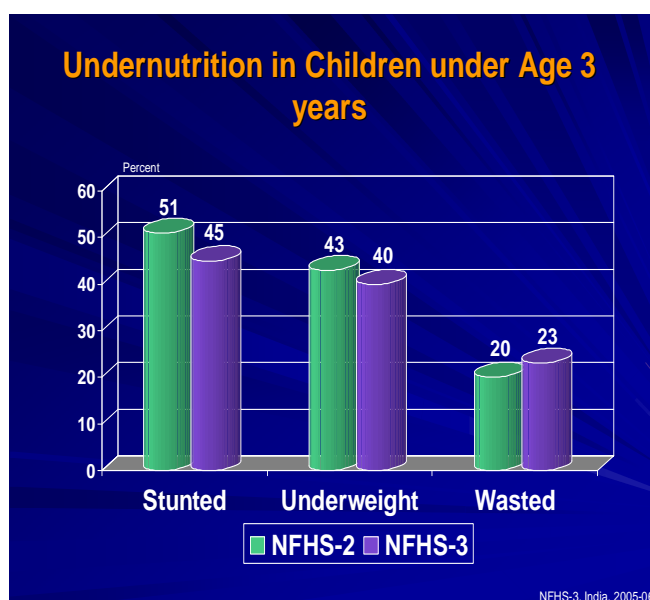
A research study on people hospitalized by ailment type in urban areas finds that 32 due to hypertension, 80 due to heart disease, 24 due to cancer, 6 due to psychiatric disorder; 24 with diabetes; 88 with accidents/injuries/ burns for every 1000 population (Chada et.al. 2007). Clear evidence of demographic, epidemiological and nutritional transition in India is associated with chronic diseases and obesity particularly in urban areas (Shetty 2002 in Radha 2009). Diseases like diabetes, coronary heart diseases and cancer are related to dietary patterns (Radha 2009). NFHS-3 demonstrates that the use of solid fuels increases the TB level; the lowest prevalence is found in households using clean fuels such as gas/electricity. Misconceptions about TB transmission are still high, suggesting the need for awareness campaigns. On the one hand, in urban areas still 62% of people are hospitalized due to diarrhoea. On the other hand there is a decline in mortality, which led to an increase in longevity but it also increases morbidity. Hence India faces a dual burden of both these groups. The National Health Policy 2002 is silent towards non-communicable disease prevention (Mishra 2005). Further, the incidence of communicable diseases is likely to decrease at a fast pace and to surpass non communicable disease in India. Furthermore, cardiac, oncology and diabetes collectively accounted for 13% of the inpatient revenues in 2006. These ailments respectively are estimated to account for 16.8% and 20.0% of hospitalization cases in India by 2011 and 2016 (Ernst & Young Analysis, Business Line 2007 in Health Care 2007). Hence a clear disease profile shifts from infectious to lifestyle diseases and increases the health care burden (Chadha, Alka 2007).

Improper dietary habits are responsible for the diseases as infections of the stomach, ENT defects, dental and skin diseases and even cancer, heart disorders and kidney ailments. In the children age 12 to 17 years dental problems are rampant due to irregular improper food habits (Senior Ahmedabad Municipal Corporation).

Obesity is of significant importance since it can lead to other severe diseases. Even children obesity causes diabetes; children have low self-esteem; women have infertility problems with which obesity and the polycystic ovary syndrome are associated. These women find it difficult to achieve significant weight loss. However, general health problems can be reduced already with a 10% loss of weight (West Dunbartonshire Council, UK, 2009).

Dietary fat and cardiac health is another significant issue in the health arena. It is very difficult to deal with dietary management because of eating out during festivals, functions and due to inappropriate life styles (Subbulakshmi, Nutritional Society of India, on World Heart day 28 September). Indians have to face the risk of coronary heart diseases (CHD) 3-4 times more than Americans, 20 times more than Japanese and 6-7 times more than Chinese. At present, 30 million cardiac patients are counted in India. A WHO study found that by 2010 there be 100 million people suffering from CHD (Sheth 2008). People whose intake of red meat is high are found to have an increased risk of development of cholesterol and liver, lung and esophageal cancer, as was shown by a study of Ananda Cross and the US National Cancer Institute in 1995.

Fig2-8: Undernutrition in children under age 3 year

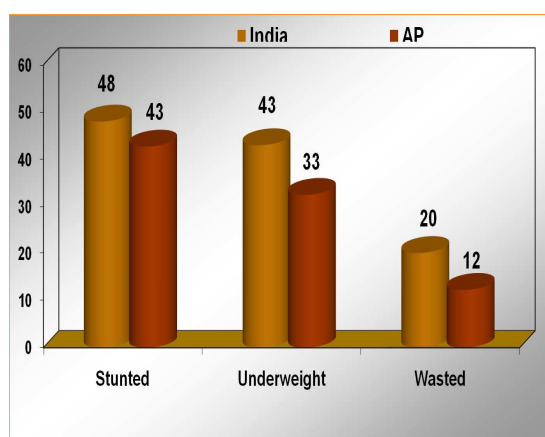


Source: NFHS-3, 2005-2006

In urban areas the levels of anaemia is 63%. Interestingly 56 percent of the On the other extreme the NFHS-3 results indicate that substantial percentage of children is undernourished by stunted growth (45%), underweight (40%), and wasted (23%). The % decline during last five years is very minimal despite various programmatic measures

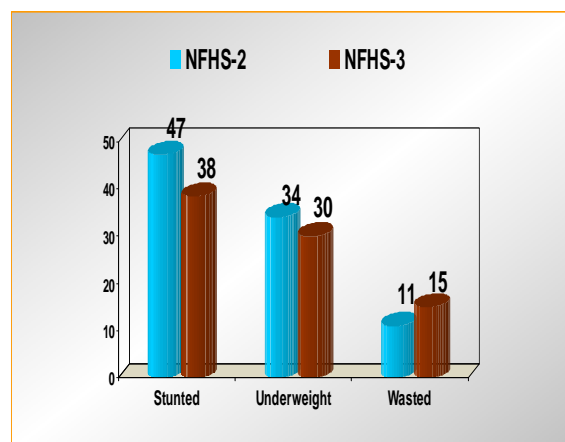
In urban areas 63% of inhabitants suffer from anemia. The NFHS-3 results indicate that a substantial percentage of children is undernourished by stunted growth (45%), underweight (40%), and wasted (23%). The decline of the percentages during the last five years is very minimal despite various programmatic measures. In Andhra Pradesh 70% of the households have children with anemia with 69% of the girls and 70 % of the boys. Even though 55% of the mothers had 12 or more years of formal education they did not prevent their children from anemia.

Figure 2-8: Under-nutrition in children under age 5, India and Andhra Pradesh



Source: NFHS-3, 2005-2006

Figure 2-9: Under-nutrition in children under age 3, Andhra Pradesh



Source: NFHS-3, 2005-2006

Over the last five years in Andhra Pradesh the percentage of underweight and stunted children marginally decreased, however, the percentage of wasted children increased and reflects the changing lifestyles. This aptly reminds on the quotation of the Noble Laureate Prof. Amartya Sen:

‘India’s record in countering hunger and famine is strangely mixed. The rapid elimination of famine since independence is an achievement of great importance.....And yet India’s overall record in eliminating hunger and under-nutrition is quite terrible. Not only is there persistent recurrence of severe hunger in particular regions, but there is also a dreadful prevalence of endemic hunger across much of India. Indeed, India does worse in this respect than even sub-Saharan Africa.’

Belonging to the new lifestyles, habits such as smoking, alcohol, chewing pan and tobacco are rated as high health damaging habits. The Sudden Infant Death Syndrome (SID) was found to be related to smoking in households with 75% of cases. Smoking is the cause for diseases as asthma; ear infections, breathing and cardio vascular problems. It is reported by birth parents who are inviting a child are preferring non-smokers (West Dunbartonshire Council UK). According to health officials, 4217 the health status of teenagers in Ahmedabad was affected due to addiction to tobacco and gutkha; 3087 children were recommended glasses; even preschool children were recommended glasses in a study conducted on about 100,000 students under the school health programme (The Times of India, Ahmedabad, 27 July, 2009).

According to NFHS-3 (2005-06), men's use of any tobacco increased by age; twice as high among adult men than among adolescents. A further analysis indicates that the use is higher in the lowest wealth quintile (74%). About one out of ten women use tobacco even during pregnancy and while breastfeeding; 36% of men chew paan masala, gutkha, or other tobacco; 33% of men smoke cigarettes or bidis; among men and women who smoke, more than nine out of ten smoked at least one cigarette/bidis in the last 24 hours; and among men who smoke, 61% smoked more than 5 cigarettes/bidis in the past 24 hours.

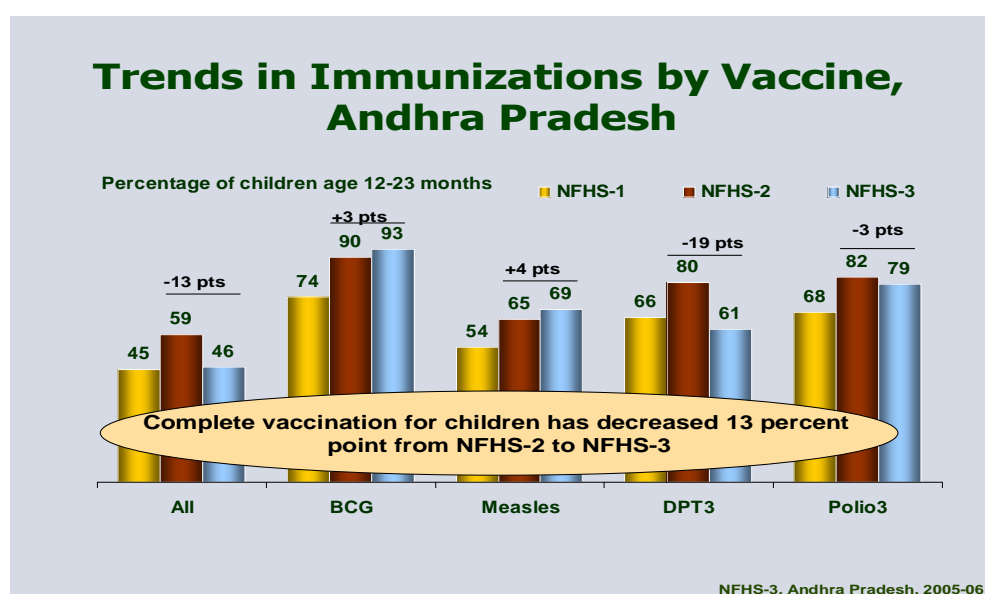
Disease profile changes between white collared and blue collared employees: Senior level executives with high incomes were afflicted with life style diseases like heart ailments, diabetes, stroke and emotional stress owing to the lack of physical exercise and dietary control. Health and Wellness Survey conducted by Apollo Hospitals Group in 2003 found that half of the executives were prone to life style diseases like cardiac risks, high cholesterol, high blood pressure and diabetes; 71% of employees and 82% of CEOs are found to be over weight (Chada et al 2007).

Stress and work also affect health. Two types of stress are to differentiate: The positive one which is also called Eu-stress and the negative one that is named distress. A study on stress conducted in Bangalore, Mumbai, Chennai, New Delhi, Ahmedabad, Pune and Hyderabad on employees in the age group of 30-45 years by the Team Lease Company found that 61% of them felt stress being healthy; only 39% believed stress is negative (Sengupta 2009). However, work place stress is a threat to India's hi-tech growth (Chaturvedi 2007). The Indian Council for Research on International Economic Relations (ICRIER) a New Delhi based research group on India's rapid economic expansion conducted studies on work- stress. Many Indian companies do not address these problems. Long working hours; night shifts and a sedentary lifestyle make people employed at information companies. Very few companies are taking care of these aspects, for example Infosys Technology Ltd., offers a 24 hour hot line for employees suffering from depression and family discord. In Bangalore psychiatrists state that their Saturdays are reserved for marriage counseling from employees of the IT sector. Total loss due to heart diseases is estimated to be 9 billion US-Dollar of India's national income. Sickness is also reflected in the man-days loss; absenteeism is mainly due to diarrhea, influenza, malaria and dengue followed by life style diseases like diabetes, stroke and mental disorders (Chada, et al. 2007).

Coming to preventive health care and with this to immunization, NFHS III report holds that only 44% of children of 12-23 months of age are fully vaccinated against six major childhood diseases: tuberculosis, diphtheria, pertussis, tetanus, polio, and measles. An increase is observed in the proportion of children fully immunized between NFHS-1 and NFHS-3; 35% to 44% respectively and a decline in the proportion of children who did not receive any vaccinations from 30% to 5%. On the contrary, the trends in vaccination coverage between NFHS-2 and NFHS-3 in urban areas show that there is a nearly two

percentage point decline in full immunization coverage between NFHS-2 and NFHS-3. The leading decrease is seen in the coverage of DPT vaccine (from 80% in NFHS-2 to 61% in NFHS-3). Drop-out between the first and third doses of DPT vaccine is a substantial problem.

Figure 2-10: Trends in immunizations by vaccine, Andhra Pradesh



Source: NFHS-3, 2005-2006

On the other hand, in Andhra Pradesh there is a decline by 13 points from 59% to 46%. In Hyderabad the percentage of children age 12-23 months fully immunized is 61. There is striking difference in coverage of immunization by the type of area of residence; in Hyderabad non-slum areas are covered with 62% and on the contrary the percentage in slums is 53. A striking difference is reported between boys (53%) and girls (39%). If a mother had at least 10 years or more of formal education, 62% of her children are fully immunized.

Table 2-2: Immunization levels

Percent of fully immunized among children age 12-23 months	
Hyderabad	61%
Hyderabad-non-slum	62%
Hyderabad-slum	53%
Girls	39%
Boys	53%
With mother 10+ years of education	62%
From the highest wealth quintile	71%

Source: own survey, 2010

Families from the highest wealth quintile are the most benefited; 71% of their children are fully immunized.

The National Polio Surveillance Project (NPSP)-WHO has not given any explanations for the increases, nor for the lack of follow-up treatment of such a large number of AFP (Acute Flaccid Paralysis). The reasons for paralysis may not be linked with polio in the children. Research data tells us that there are cases related with PV vaccine-derived strains, due to an over dosage of Oral Polio Vaccine (OPV). Several cases PV (Polio Vaccine) strains were derived from faecal samples of such paralysis cases in Brazil and their characterization confirmed the polio vaccine origin of these strains and the presence of mutations known as neuro-virulence (Frederich 1997 in Indira Chakravorthy 2009). The etiology of the increasing paralysis in children needs to be studied in India. For there are 21, 338 cases of AFP where none of them were followed up. Chakravorthy holds that in 2005 of the 10, 055 cases only 2,553 cases were confirmed or compatible with polio (Indira Chakravorthy 2009). Every year out of 25 million children born in India, nearly 2 million die before reaching the age of one and many are disabled by polio or blinded by Vitamin A deficiency malnutrition. Tuberculosis claims 500,000 lives each year; waterborne and water related diseases like diarrhea, typhoid, cholera and infectious hepatitis account for 80% of India's health problems. Even in 2001 people die for the same health reasons as in in 1947. Infant mortality in Andhra Pradesh is high, close to national average. Most of the infant deaths occur in the first month of life. Male children experience higher mortality than girls, thereafter girls experience higher mortality until the age of 5. Teenage motherhood and short birth intervals increase lead to higher infant mortality. Today babies continue to die of treatable respiratory infections, diarrhea and other illnesses, which would be preventable through clean water, nutritious food and treatable with basic drugs (Hyderabad District Health Plan-2006). For instance, in Andhra Pradesh 43% of children under the age of

5 with diarrhea received some kind of oral dehydration therapy (ORT) in the two weeks before the NFHS-3 survey was conducted. 37% were treated with a solution prepared from oral dehydration salt (ORS) packets and 8% received gruel. One in four children (25%) did not receive any kind of treatment. 32% received antibiotics, which are not normally recommended for treating childhood diarrhea. Knowledge about feeding during diarrhea is low. Information on feeding practices during diarrhea revealed that children should be given more liquids to drink than usual, but only 10 percent of children actually receive more liquids. 61% of children with diarrhea receive less to drink than normal and 4% receive nothing to drink, which can increase the risk of dehydration. Children should continue to be fed, but 53% received less food than usual, 8% did not receive food at all. About three quarter of women who gave birth within the past 5 years know about ORS packets. However, the use of ORS is low.

Malarial infections cause more than 1 million deaths each year (World Bank 2008). While epidemiological shifts in India showed 75 million cases of Malaria in 1951, 2.2 million in 2000 were counted; leprosy cases for 10, 000 population are 38.1 in 1951 and 3.74 in 2000; smallpox cases where more than 44,887 in 1951, the disease had been eradicated by 1981. Further there were 29,709 cases affected with polio in 1981 and this number had been reduced to 265 by 2000. Infrastructure facilities have been increased as is shown by the number of hospitals from 9209 in 1951 to 43,322 in 2000 (Naryan 2006).

Cholera remains one of the most dreaded diseases affecting mankind due to the lack of access to clean water and sanitation. In 2007 the WHO recorded 177,963 cases and 4031 deaths worldwide. India reported to the WHO from 2003- 2007 a few thousands with a fatality of < 1%. Improved accesses to clean water are the main ways of cholera control. The WHO recommended oral cholera vaccines (OCV) for the control of epidemic and endemic cholera. Dr N.K. Gangulay held that long term interventions as improved sanitation, water safety and hygiene are essential but present a challenge. Further he also said that global warming and globalization may lead to an increase in cholera cases worldwide, not just in developing countries (GOI 2009).

In developing countries there is an epidemiological transition shifting from early childhood to adolescence and young adulthood. Now there is a trend to see Hepatitis-A as a regular vaccination for children (Mathur and Arora, 2008).

Figure 2-112: Urban health status

NFHSIII holds that the urban poor suffer from the under 5 mortality rate (72.7) which is higher than average 51.9; 50% of urban children suffer from underweight; more than 60% of urban children miss total immunization before completing first year. Poor environmental conditions in the slums and high population density and cause vulnerable diseases like asthma; tuberculosis (TB); also vector borne diseases (VBDs) and malaria.

Regarding preventive health care by employer, ICRIER conducted a study on 81 companies in which they found a loss of approximately 14% of their annual working days due to employee-sickness. Only less than a third of these employers provide their employees with preventive healthcare measures,

The emergence of health cities is another topic on interest. Health cities are evolving concepts for health care in India that provide for a better and major corporate health care. Research finds upcoming health cities as Dr. Naresh Trehan's Medicity, Gurgaon; Fortis Medicity, Gurgaon; Fortis Medicity, Lucknow; Apollo Health city, Hyderabad (with 700 beds, 33 acres area and investment with 243 US\$ million); Nagapur Health city, Nagapur; Chennai Health city, Chennai, Bengal Health city near Durgapur (with 5 000 beds; investment with US\$487 million) and Narayan Health city, Bangalore (with 488 beds) (IBEF 2007). Health cities are looking also to cater the need of large populations by offering facilities such as hotels; residential facilities; recreational facilities of spa, gym and even golf courses. NABH accreditations held that around 15-20 health cities are going to come up in the next 5 years (IBEF 2007).

Also alternative networks of health care mechanisms exist, these are found mainly in the changing attitudes of people. Education taught people to view health as a holistic wellbeing through a blend of modern and traditional medicine. Thus, alternative health care centres have emerged in the city as diet and nutrition centres, gym and fitness centres, yoga centres, Tai Chi centres for improving flexibility, coordination and stress reduction. Herbal medicine, humour therapy, healing touch therapy, stress management including relaxation and meditation, biofeedback, acupuncture including techniques such as EFT (Emotional Freedom Technique) and Pranic and crystal healing have also emerged (IBEF, 2007). Apart from these, also Homeopathy, Ayurveda Siddha, Unani, Vipasana and Naturopath are known. Health help lines through the media are another way to improve the knowledge on health. NGO's and other voluntary and monetary based counseling are helping especially women to regain mental strength. The Satyam foundation uses the Urban Health Posts (UHPs) in slum areas to run clinics for the poor with their own staff after the usual working hours of the public health facilities. Four UHPs operate in the evenings to cater the health needs of daily wagers, domestic helpers or petty shop keepers without affecting the

earnings of these workers. Maternal and child care is a major service offered by this foundation (Ranbaxy Science XX Round Table conference 2008).

Infrastructure facilities have been increased; the number of hospitals from 9209 in 1951 to 43,322(95-96-CBHI) in 2000 (Naryan. J, 2006, National Health Policy-2002, compiled). As per health care services, Government expenditure on health care is about 0.9% of the GDP; as compared to 3% of developing countries and 5% of developed nations. Research further shows that the bulk of health care is catered by the private sector which is one of the largest in the world with 80% of physicians; 75% of dispensaries and 60% of hospitals (Chadha, Alka et al, 2007). As per health care services, the government expenditures on health care is 1.1% of the GDP; as compared to 3% of developing countries and 5% of developed nations. Access to maternity services is 74.6% in large capital cities; 68.1% in small cities and 61.6% in towns (NFHS-2005-06). Under five mortality rate among the urban poor is 57.7% in large/capital cities; 61.3% in small cities and 74.7% in towns (a large city is defined with more than one million populations; medium-sized cities are those with 100,000 to 1 million and towns are those with less 100, 000 population). Public spending on health has stagnated at 0.9% of the G.D.P. since the mid-1980s and the Indian Government's per capita expenditure is one of the lowest in the world (US\$ 7, as against US\$ 2,548 in the United States Chadha, Alka, 2007). According to the study of Ernest and Young (2006) (in Chadha, Alka 2007), the richest one third of the population accounted for three fourths of total private health care expenditures. Largely it is the private sector that possesses 80% of physicians, 75% of dispensaries and hospitals of the total providers. Alka Chadha's recent study (2007) finds that preventive health care holds an enormous promise for the competitiveness of Indian companies and for the country's global arena.

Now coming to health care and the issue of falling into poverty, studies held that escaping from and falling into poverty are not symmetric in terms of reasons. Hence two different policies are required, one to promote more escapes from poverty and the other to reduce the number of descents who fall into poverty due to health care expenses. Krishna (2007) found in his study on India, Kenya, Uganda and Bangladesh that households who were formally well-off fall into poverty every year due to ill health and high health care expenses. Health problems like cancers and catastrophic payments were primary reasons for descents into poverty. 60% of affected persons, recorded in villages of Rajasthan, 74% in Andhra Pradesh and 88% in Gujarat blamed ill health, hard to reach medical facilities and health care expenses as reasons for poverty. The study also found that in some exceptional community in Panelav village of Panchamala district in Gujarat only seven, a lower number when compared with other places out of total of 106 households, have fallen into poverty trap due to involvement and help by NGO-run health clinic (Krishna 2007).

2.2.3 *Initiatives for Environmental Health*

Initiatives for health include initiatives for good environment too. While man was grown in a natural state, evolution and intervention of democratic states enable people today to restore their health as a right.

Many international initiatives focused on health in relation to the environment. It was the UN General Assembly in 1972 that came out with guiding principles of environment where man has a right to an environment of quality; also it insists on man's duty to protect the environment (Chatopadhyay 2007). The Alma Ata Declaration 1978 viewed health as an integral part of the socioeconomic development of a country. The declaration recommended for primary health care education concerning prevailing health problems; promotion of food supply and proper nutrition; adequate supply of safe water and basic sanitation; maternal and child health care; family planning; immunization against major health diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; promotion of mental health and provision of essential drugs (WHO 1978). The World Commission on Environment and Development (WCED), 1983 described sustainable development as "development that meets the needs of the present without comprising the ability of future generations to meet their own needs". Later in 1992 the Earth summit or known also as Rio conference adopted an action plan for clean water, health, and reduction of poverty. One of the eight UN Millennium Development Goals of the UN millennium Summit 2000 promises to ensuring environmental sustainability and reduction of the percentage of the population under extreme poverty. The Intergovernmental Panel on Climate Change (IPCC) emphasizes the importance of social environmental equity in development (Chatopadhyay 2007). The International consensus has emerged to reduce incidences/deaths arising out of communicable and preventive diseases, through the UN Millennium Development Goals, keeping 1990 as a benchmark. Of these eight goals, three are health centred: (i) to reduce under 5 (infant/child) mortality by two thirds; (ii) to reduce maternal mortality rate by two fourths; and (iii) to combat human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), malaria., tuberculosis (TB), and other diseases by not only halting their rising incidences but also by reversing their speed. The seventh goal of the UN Millennium Development Goals is to ensure environmental sustainability. This includes access to water and sanitation. A Joint Commission International (JCI) was launched in 1999; currently JCI surveys nearly 20,000 health care programs through voluntary accreditation. The World Health Organization (WHO) designed the Joint Commission International and the Joint Commission on Accreditation of Healthcare organizations (JCAHO) as its collaborating centre for patient safety in 2005. Presently in India the Indraprastha Apollo hospital, Delhi; the Apollo hospitals in Chennai and Hyderabad; the Asian Heart Hospital and the Wockhardt Hospital in

Mumbai and the Flortis Health care in Mohali are accredited for a quality drive approach (Joint commission resources 2007 in Health Care 2007).

National initiatives for health and environmental sanitation can be traced back to pre-independence times where a sense of need for potable water and better sanitation for the British army was identified (Ramasubban 1982). The Bhore committee in 1944 and the Environmental Hygiene Committee in 1948 focused on water, sanitation and public health. Medical Institutes as the Malaria Institute of India in 1956, the National Tuberculosis Institute, in 1960s National Institute of Health and Administration in 1971 and All India Institute of Hygiene and Public Health, 1980 were established (Banerji, 2005).

The National Five Year Plans initiated health programmes either directly or indirectly viz. the Central Rural Sanitation Programme (CRSP), the Integrated Rural Sanitation Programme (IRSP) and the International Drinking Water Supply and Sanitation Decade (1980). Though water is a state subject, nearly 40% of the total investments by centres are on water. The 73rd Constitutional Amendment vested enormous powers to Panchayati Raj Institutions. Meanwhile, sector reforms have been introduced; reforms supported the processes introduced by multilateral and bilateral projects. The Ninth Plan (1998-2002) Working Group endorsed this. The sector reform is now being implemented as the Total Sanitation Campaign (TSC) involving all stakeholders. The 74th Constitutional Amendment 1992 on urban local bodies (ULBs) provides for constitutional status, financial powers and devolution of greater responsibilities for municipalities. It furthermore provides state legislature to guide state governments to assign various responsibilities to municipalities.

Table 2-3: Evolution of maternal and child health programmes

Year	Milestones
1952	Family Planning Programme adopted by Govt. of India (GOI)
1961	Dept. of Family Planning created in Ministry of Health
1971	Medical Termination of Pregnancy Act (MTP Act) 1971
1977	Renaming of Family Planning to Family Welfare
1978	Expanded Programme on Immunization (EPI)
1985	Universal Immunization Programme (UIP)+ National Oral Rehydration Therapy (ORT) Programme
1992	Child Survival and Safe Motherhood Programme (CSSM)
1996	Target-free approach
1997	Reproductive and Child Health Programme -1 (RCH-1)
2005	Reproductive and Child Health Programme -2 (RCH-2)
2005	National Rural Health Mission

Source: own compilation

Further, Health for all-An Alternate Strategy commissioned by ICSSR and ICMR (1980) argued that most of the health problems of a majority of India's population are amenable to being solved through primary healthcare centres and community participation, which is recommended for the National Health Policy.

This policy in 2001 aimed at to eradicate yaws by 2005, eliminate leprosy by 2005; eliminate kala azar by 2010 and eliminate lymphatic filariasis by 2015; reduce mortality by 50% on account of TB, vector and water borne diseases by 2010; reduce prevalence of blindness to 0.5% by 2010. The National Health Policy (NHP) nevertheless prioritized reduction of less than five years mortality, maternal mortality and communicable diseases, but it is silent towards non-communicable disease (Mishra). The National Population Policy (NPP) 2000 focused on family planning, maternal and child health. It is through unmet needs of contraception, healthcare infrastructure, health personnel; integrated delivery for basic reproductive and child care services.

Recognizing the importance of health in the process of economic and social development and improving the quality of life of our citizens, the Government of India has resolved to launch the National Rural Health Mission to carry out necessary architectural correction in the basic health care delivery system. The Mission adopted a synergistic approach by relating health to determinants of good health viz. segments of nutrition, sanitation, hygiene and safe drinking water. It also aims at mainstreaming the Indian systems of medicine to facilitate health care. The Plan of Action includes increasing public expenditure on health, reducing regional imbalance in health infrastructure, pooling resources, integration of organizational structures, optimization of health manpower, decentralization and district management of health programmes, community participation and ownership of assets, induction of management and financial personnel into district health system, and operationalizing community health centers into functional hospitals meeting Indian Public Health Standards in each Block of the Country. The Goal of the Mission is to improve the availability of and access to quality health care by people, especially for those residing in rural areas, the poor, women and children.

The National Rural Health Mission (NRHM) is an ambitious strategy of the government to restructure the delivery mechanism for health. The strategy of the Mission has been drawn out over a period of almost 6 months through wide ranging Stakeholder Consultations with state governments and planning commissions. Though NRHM in nomenclature talks of rural health, it also addressed the urban populations with common goals; such as

- Reduction in Infant Mortality Rate (IMR) and Maternal Mortality Rate (MMR).
- Universal access to public health services such as women's health, child health, drinking water, sanitation & hygiene and nutrition.

- Prevention and control of communicable and non-communicable diseases, including local endemic diseases.
- Population stabilization, gender and demographic balance.
- Access to integrated comprehensive primary healthcare.
- Revitalizing local health traditions and mainstreaming AYUSH.
- Promotion of healthy life styles.

Hence NRHM aims to provide for an accessible, affordable, acceptable and accountable health care through a functional public health system. It is designed to galvanize the various components of primary health system, like preventive, promotive and curative care, human resource management, diagnostic services, logistics management, disease management and surveillance, and data management systems etc. for improved service delivery.

Understanding the need for deprived sections in urban areas a special program called National Urban Health Mission (NUHM) is proposed to meet the health challenges of the urban population especially the urban poor with a special focus on slums. However, it is shelved for time being and is proposed to be included under the twelfth Five Year Plan period. Instead of separate programmes as NRHM and NUHM, it is proposed to have a combined programme called National Health Mission (NHM). NHM would commence as a centrally sponsored scheme in the first year of implementation during the XIIth plan period. From the second year onward it would be financed through sharing mechanism between the central government and state government/urban local bodies.

NFHS-III holds that the urban poor suffer from the under 5 mortality rate (72.7) which is higher than average (51.9); 50% of urban children suffer from underweight; more than 60% of urban children miss total immunization before completing 1 year. Poor environmental conditions in the slums make high population density and cause vulnerable diseases like asthma; tuberculosis (TB); also vector borne diseases (VBDs) and malaria. In order to address these health problems NUHM will work for the remaining period of the 11th plan (2008-2012). Other aspects of NUHM include coverage of 430 cities (total) with population above 100,000 people and state capitals during phase-I as well as district headquarter towns with a population less than 100,000 under phase-II of the mission.

NUHM focuses on population listed and unlisted urban slums; vulnerable population as homeless, rag-pickers, street children; rickshaw pullers, construction and brick and lime kiln workers, sex workers, any other temporary migrants. NUHM proposes a broad framework for strengthening primary public health systems, rationalizing the available manpower and resources, fill gaps in service delivery through private partnerships; regulatory frame work; communitized risk pooling/insurance mechanism with IT

enablement, capacity building of key stakeholder; special provision of services vulnerable poor.; improvement in services of IPHS/revised IPHS for urban areas. It proposes to promote effective management with non-Governmental sector (for profit/non-profit) to service better the urban poor through identification of target groups (slum dwellers and other vulnerable groups) preferably through the distribution of Family/Suraksha Cards. NUM would encourage participation of the community in the planning and management of health care services to Urban Social Health Activist (USHA) in urban poor settlement (one USHA for 1000-2500 urban poor population covering about 200 to 500 households). It will ensure participation through community based institutions like Mahily Arogya Samiti (20-100HH) and Rogi Kalyan Smities. It mandates special attention to construction workers, rag pickers, sex workers, brick workers and rickshaw pullers.

In addition to above objects under NHM, states may decide to constitute a separate City Urban Health Mission/City Urban Health Societies in view of the 74th Constitutional Amendment, or use the existing structure of the District Health Society/Mission in urban areas. It is proposed to promote urban health insurance to meet the costs of surgery and hospitalization; quality and cost. NUHM will establish synergies with programmes like JNNURM, SJSRY, ICDS to optimize outcomes. NUHM aims to provide for health services through convergence of all communicable and non-communicable disease including HIV/AIDs with an integrated planning at city level.

Regarding the budget for health in India, the total allocation for health was Rs 165, 340 million for the year 2008-09. This shows an increase of 15% in comparison to the year before. Rashtriya Swasthya Bima Yojana (a new health insurance scheme) allocated Rs 2,050 million; this scheme is to provide Rs 30,000 for every worker in the unorganized sector falling below poverty line (BPL). Further the national programmes for elderly has proposed a plan with an out lay of Rs 4000 million. Its related programmes include National Institute of ageing with eight regional centers and a department of geriatric medical care in one medical college/territory level hospital in each state (Chandrakanth Lahariya 2008).

The India Vision 2020 envisages access to health care for women and children, eliminating childhood deaths from diarrhoea by 2010; effective targeting of undernourished children, restructuring malaria workforce to reduce incidence by 50%;improving diagnostics and treatment of TB; addressing the state of under-equipped, under staffed and under-financed health care infrastructure and to suggest increasing public spending from 0.8% to 3.4% of the Gross Domestic Product(GDP) as per planning commission (Government of India, 2002, in Mishra, Srijit) (see further reference National Human Development Report, 2001).

The National Commission on Urbanization (NCU), 1988 aimed at a compact city to maintain a sustainable urban form. Compact city means high density, mixed land use, and efficient public transport

planning that encourages pedestrian oriented habitation. The Eleventh Five Year Plan (2007-12) emphasizes those governments at all levels to strive to remove all possible obstacles for equitable accesses to land. National Transport policy of India 2006 recommended transport that is energy efficient, conserves the environment and meets social demands (Chatopadhyay 2007).

2.3 Recent Adaptation Measures against Climatic Change and Health

Considering today's climatic changes rooted in the human need, avarice and automation and consequential changes in the environment and its effect on global population, useful and new mitigation measures are thought by all for the health of all. As mentioned at the outset, now the question is not who caused the damage in the past or in the present, but how best all can cope up and coordinate with each other for the benefit of the vulnerable population.

“Adaptive capacity is the ability of a system to adjust to climatic change, including climate variability and extreme to moderate potential damages, to take advantage of opportunities, or cope with the consequences. Adaptive capacity may be natural or man-made (Shukla et. al.2003). For example natural adaptability we only found in animals, birds seeking their shelter, preparing for the forthcoming seasons and in their migration to seek food or gestation periods. “Changing their adaptation is the degree to which adjustments are possible in practices, processes or structures of a system. Adaptation can be spontaneous or planned, and can be carried out in anticipation or in response to climatic change” (Shukla et. al.2003).

Approaches to adaptation are mainly of three types. One is the impact approach where only an unidirectional form is used. This means comparing climatic changes with non-climatic factors. The second approach is by interacting climatic changes with other factors as socio-economic aspects etc. Now the recent approach is an integrated approach where climatic changes are studied in a broader social context and environment and looks into the gaps in knowledge. This model is called Integrated Assessment Model (IAM). However research finding holds that these models need to be improved as well (Rotmans and Dowlatabadi, 1998 in Shukla 2003). The following are some recent adaptations to protect people from environmental health hazards:

Recent efforts in developing nations to restore health are mainly through multi-sectoral initiatives. Though each country has its specific way to address environmental health, they incorporated environmental health activities into child health programmes, poverty reduction, infrastructure projects (water, sanitation, rural energy) nutrition initiatives and through other multi sectoral approaches (World Bank 2008). As an example for health activities relating to children, the Integrated Management of

Childhood illness (IMCI) was established by WHO and UNICEF in the mid 1990's in countries as Peru, Nicaragua, Canandaigua, and Cuzco. Also ICDS in India included hygiene awareness and hand washing practices for children (Grangoloti et al. 2006 in World Bank 2008). In Thailand the national nutrition programme was able to reduce malnutrition of under-five population from 25% in 1986 to 15% in 1995. This programme also took care of basic primary health; latrines and clean water; a literacy programme; agricultural production projects, village development projects as creation of fish ponds or development of water sources and employment during dry seasons (Heaver and Kachondam, 2002 in World Bank 2008). Mexico through political commitment is aiming to reduce child mortality by 2015 by providing clean water and universal vaccination. In this process appropriate water chlorination of drinking water is ensured and have banned the use of sewage water for crop cultivation (World Bank 2008).

Another way of adaptations are vector control programmes. A review of 40 studies on Malaria held through a package of multiple interventions for malaria, guided by experts in malaria epidemiology, entomology, vector ecology and land water engineering, reported a high protective efficacies in nations as Malaysia and Africa. In Malaysia personnel from agriculture, medicine, transportation, urban planning and army are also involved in this programme (Flemming et al. 2004 in World Bank 2008). African vector programmes found that mosquito ecology demands that environmental manipulation be supplemented by bed nets and indoor residual spraying (Touré 2001 in World Bank 2008). In Vietnam a dengue control programme was successful through involvement of technical experts, health workers, school teachers and school children who participated in awareness of mesocyclops (Das Gupta et al. 2006; Ha and Huan 1997; Kay and Nam 2005; Vu and others 2005 in World Bank 2008).

The role of local governments too are evolving to promote an integrated approach to health and provide civic amenities related to environmental health. Active participation of local government through intersectoral coordination between health and other departments helped in improving health (Malaviya and others, 2006 in World Bank 2008); mobilization of citizens and health support activities like collecting disease surveillance information; dissemination of public health message are some examples. In west Bengal local governments used NGO's to set up profit "sanitary marts" and was successful in adoption of personal latrines (Majumdar 2004 in World Bank 2008). The role of locals governments is increasing to strengthen communication and advocacy; reorient environmental health work force and establish and enforce regulations. Unlike a century ago, the role of health force is reoriented through in-service training; in South Africa the role of health officer varies from law enforcement to community participation and development (Mathee, Swanepoel and Swart 1999; Thomas Seager, and Mathee 2002 in World Bank 2008).

A good web of institutions, infrastructure services, good living standards, livelihoods, through provisions for water, sanitation, drainage, and solid waste collection and regulations to protect all the segments of populations are the measures generally taken by high income nations to protect all the segments of the population. Infrastructure provision investments and insurance methods for housing and infrastructure working against impacts of disasters like floods, earth quakes and other risks in relation to injuries and deaths and those are much reduced due to investments in high income nations. These countries also ensure aspects like sanitation, water supply, health care provisions and prevention and rehabilitations against disasters:

Inclusion of all channels to enhance quality control, that means not simply complaining to government officials in case of a general/health risk, but involvement of other channels like lawyers, ombudsmen, consumer groups, and others in civil society, are some other measures. Coverage of services is an advantage for all as it maintains the standards, especially for vulnerable sections.

Investment means investing in environmental sustainability and disaster management but not simply aiming at economic growth (Elliot 2008). China's net migration amounts to 17 million by 2000 through its market-driven movements (Mc Granahan et al.).

Regulatory work: In some high income nations regulations ensure occupational health, safety, pollution control playing key role in urban planning. Partnerships with low-income groups by local Governments demonstrate cheaper ways to meet their needs (D'Cruz and Satterthwaite, 2005; Hasan 2006).

In adaptation and protection of urban environmental health is a measure adopted by high income nations as a role of good urban Governance.

Good provision for storm and surface drainage, land use management, use of parks and other areas of open space to accommodate floodwater and some flood defenses and building institutional capacity is another measure in high income nations. So do Pro-poor attitudes at the times of disasters and as preventions.

Mechanisms to design internal temperature control and institutional capacities against high temperature due to climatic change is another measure, which protects people from heat-stress that affects health and productivity (Satterthwaite, 2008).

3 Methodology

The objective of the study is to assess the environmental health risks in Hyderabad in the context of global changes. The sub-objectives are

- to assess the inter-linkages between livelihood pattern and health of the people in Hyderabad
- to correlate the factors associated with growth and expansion of urban areas and its inter-linkages with health.
- to look at the changing life styles of people and health
- to explore the availability of health facilities vis-à-vis accessibility and affordability of the people and
- to discover the alternate networks adopted by people to combat health crisis.

The present study is empirical in nature and was conducted in the metropolitan city of Hyderabad. A stratified random sampling method is used for the selection of the area and as well for the households. The following four different areas of Hyderabad are selected for the study based on the period of settlement

- Long standing settlements (Hyderabad Old City - Nizam's era)
- Middle class settlements of (Hyderabad Gandhi Nagar - represents independence era)
- Lower middle class settlements (Industrial area – Patancheruvu)
- Recent settlements (Cyberabad - represents post economic liberalization era)

In each of the region one slum locality and one non-slum locality is surveyed.

To test the above said objectives, the data is collected through the following methods. Both quantitative and qualitative methods of data are used for the study.

- Household survey
- Focus group discussions

- In-depth Interviews



Picture 3-1 FGDs with men



Picture 3-2 FGDs with women

Standardized schedules are prepared to collect quantitative data during the household survey.

Before finalizing the schedule, pre-testing was carried out to assess the quality of data that was obtained with the help of the tool. In each locality 50 households are canvassed for the study from each locality; a total of 200 households are covered.



Picture 3-3: One of the respondent's house at Pattancheruvu

A group of students currently pursuing research in one of the universities of Hyderabad were selected as investigators for collecting data. These students were initially trained systematically on the objective,

sampling frame and each component of the structured questionnaire. After assessing the capabilities of the investigators, the best competent persons were selected for the data collection procedure. In each locality 2 focus group discussions were carried out separately for men and women.

Providers' perspectives on environmental health situations were collected by in-depth interviews. At least two individuals in each region were interviewed in-depth to understand societal hindrances, accessibility, affordability, household situation and individual traps in sustaining health.

4 The Greater Hyderabad Municipal Corporation: A Profile

4.1 Historical Background

From nawabs and pearls to the world's hi-tech happening point, the city's journey is fascinating: the metropolis is coming to terms with itself in the new millennium. The history of Hyderabad district was inextricably bound up with the rise and fall of various kingdoms, which flourished in the Deccan during the medieval and modern times. The Kakatiyas of Warangal were the first important rulers of this part of the country between 1150 and 1323 A.D. Muhammed-bin-Tughlak, who broke the Kakatiya power in 1323, held sway for some time after which the royal court of the Bahamani Sultan held the Deccan for about two centuries. On their decline, the Barid Shahi kingdom rose to power, which, for unknown reasons, dwindled by about 1609. Then the famous Qutub Shahis of Golkonda (1512-1687) and its reign opened a glorious chapter in the annals of Hyderabad and ruled the Deccan for almost 171 years. It was in the reign of the fifth descendent of this dynasty, Muhammed Quli, that the nucleus of Hyderabad city, renowned for its magnificent mansions, had been laid in 1589 A.D on the river "Musii", five miles (8 km) east of Golconda.



Picture 4-1 Palace during Nizam period



Picture 4-2 Qutubshah tombs

It was as big as England & Scotland put together. The rule of seven Nizams saw the growth of Hyderabad both culturally and economically. Charminar, the iconic monument of the city, was built in 1591 reportedly in gratitude to the almighty for arresting the plague epidemic before it caused irreversible damage to his new city.



Picture 4-3 Old Bridge on Musi river



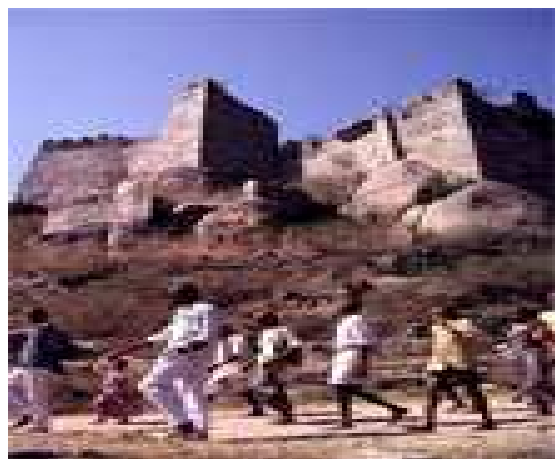
Picture: 4-4 Charminar

The Purana Pul (old bridge) spanning the Musi was built a few years enabling quick travel between Golconda and Hyderabad. The early history of Hyderabad is inextricably intertwined with the history of the Qutub shahi dynasty. In the early 17th century, Hyderabad became a centre of a vibrant diamond trade.

Qutub Shahi Sultans contributed to the growth and development of Indo-Persian, Indo-Islamic literature and culture and also to the local telugu culture. In the 16th century the city grew to accommodate the surplus population of Golconda and eventually became the capital of the Qutub Shahi rulers. Hyderabad became known for its gardens (called baghs) and its comfortable climate. Visitors from other lands compared the city to the most beautiful city of Isfahan in Iran. Mir Osman Ali Khan founded the eponymous Osmania General Hospital and Osmania University-- the first modern university teaching in an Indian language (Urdu) and the first university after ancient Nalanda and Takshashila. Huge reservoirs like the Nizam Sagar, Tungabadra, Osman Sagar, Himayat Sagar and others were built. Survey work on Nagarjuna Sagar had also begun during this time.

However, towards the close of the 17th century the fortress of Golkonda fell to the sword of Aurangazeb (1687) who made it a part and parcel of the Mughal Empire and nominated Chin Kalich Khan (Asaf Jhah) as Subedar of the Deccan, who in turn, made himself the master of the Deccan after inflicting a signal defeat on Mubariz Khan (who was secretly instructed by the Mughal Emperor) in the famous battle of

Shakarkheda on the 11th October 1724. This battle, which was renamed Fathkhera by the Nizam-ul-Mulk, marks the establishment of the Asif Jahii Dynasty and with it the establishment of an autonomous Deccan. It also marks the end of the medieval period in the history of the Deccan and the commencement of the modern period, which was identical with the end of the Mughal hegemony and the definite establishment of the Asif Jahi rule.



Picture 4-4 Golconda Fort



Picture 4-5 Mosque



Picture 4-7 Inside Salarjung Musuem



Picture 4-6 High court

The state and the dynasty founded by Asaf Jhah – had contributed to the evolution of the Hyderabad state. He also instituted the title of the Nizam which had become since then the hereditary and dynastic title of the successive rulers of this state and thus, he became the founder of the house of the Nizams (1724).

In 1869, for the first time the Kotwal-e-Baldia, the City Police Commissioner used to look after the Municipal Administration. In the year 1869, Sir Salar Jung-I, the then Nizam has constituted the Department of Municipal and Road Maintenance and a municipal commissioner was appointed for

Hyderabad Board and Chadarghat Board. By then, the city covered an area of 55 square kilometers and had a population of 350,000. In 1886 Chadargat became Chadarghat Municipality.

In 1921 Hyderabad Municipality has increased to 84sq.km. These two boards were amalgamated in the year 1933 into a corporation and given statutory status under the Hyderabad Municipal Act. In 1934 for the first time elections were held for municipal corporation and a standing committee was appointed. In 1937 Banjara Hills, Jublee Hills etc merged into Jublee Hills Municipality. In 1942, the Corporation status was removed due to certain issues. In 1945 Secunderabad Municipality was formed. The district remained a part of the Nizam's dominion until it became part of the Indian Union in 1948.

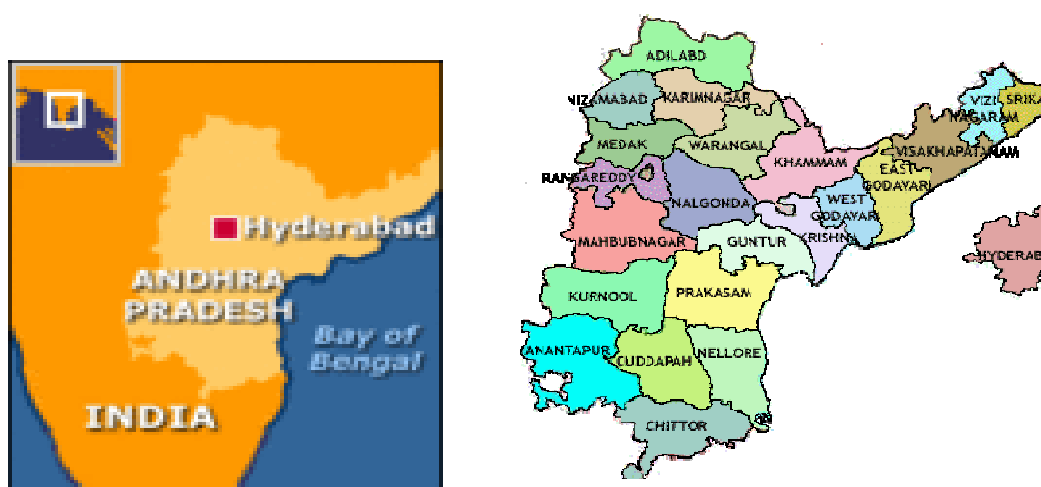


Figure 4-1: Location of Hyderabad district in Andhra Pradesh State, India

In 1951 it became corporation. In 1950, two separate corporations were created under the Hyderabad Corporation Act, 1950. One for the city of Hyderabad and another for the city of Secunderabad. These two corporations were again merged into a single corporation by the Hyderabad Municipal Corporation Act, 1955. It was finally merged in the enlarged state of Andhra Pradesh on 1st November 1956, when the sovereign independent republic of India implemented the States' Reorganization Act with a view of redrawing the political map of India, delimiting and alienating the boundaries of the states so as to weld together the people speaking the same language.

The district of Hyderabad was bifurcated into two districts with effect from the 25th August 1978 as Hyderabad Urban and Hyderabad Rural. Subsequently the districts of Hyderabad (Urban) and Hyderabad (Rural) were renamed as Hyderabad district and Rangareddy district respectively. All the rural areas of Hyderabad district have been included in Rangareddy district, while the area under the Municipal

Corporation of Hyderabad (excluding a small part), Secunderabad Cantonment and Osmania University are included in Hyderabad district. From 1956 to March 2007, it underwent many changes and provided services to citizens by dividing the city in four zones and seven circles. In 1960, the budget of the Corporation was 1.5 crores Rs. and it has raised to 1000 Crores within the following 45 years.

4.2 Greater Hyderabad Municipal Corporation

The Andhra Pradesh government in April 2007 announced the merger of 12 municipalities within the limits of the Hyderabad Municipal Corporation (MCH) and the constitution of the Greater Hyderabad Municipal Corporation (GHMC). From April 2007 onwards it became the Greater Hyderabad Municipal Corporation based on notification released on 16th April 2007 by the state Government of Andhra Pradesh. The city is divided into five zones (including North, South, Central, East and West) and 18 circles to provide better services. The city has grown from 175 to 650 square kilometers. It has merged into 12 municipalities. The population of the city is 6,700,000 as compared with the earlier area of MCH, which had 172.6 square kilometers with a population of 4,500,000. The following municipalities which are in the Rangareddy and the Medak district are now merged in the Greater Hyderabad Municipal Corporation.

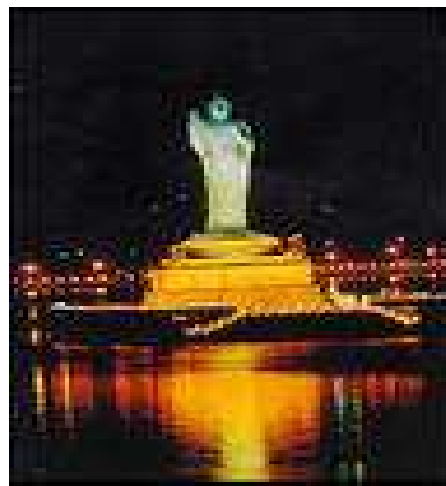
- L.B. Nagar
- Malkajgiri
- Quthbullapur
- Patancheru
- Gaddiannaram
- Kapra
- Kukatpally
- Ramachandrapuram
- Uppal Kalan
- Alwal
- Serilingampalli
- Rajendranagar



Figure 4-2: Mandals in Hyderabad



Picture 4-8 Birla Mandir



Picture 4-9 Budha Statue in Hussain Sagar lake

Table 4-2: List of Mandals in Hyderabad District

ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5
Abids	Habsi guda	Dilsuknagar	Gudimalkapur	Amberpet
A.C Gards	Lalapeta	Malakpet	Karvan	Tilaknagar
Baghlingampalli	Musheerabad		Langar house	
Basheerbagh	Mettuguda		Mehdipatnam	
Dool peta	Nacharam		Tolichowk	
Gowli guda	Padmarao Nagar			
Liberty	Tarnaka			
M.J market	Warasi guda			
Naryanguda				
Ramnagar				
ZONE 6	ZONE 7	ZONE 8	ZONE 9	ZONE 10
Alwal	Hyderguda	Ameerpet	Kukatpally	Boggulakunta
Bowenpalli	Rajendranagar	Banjarahills	Zone 9(A)	Baghlingampalli
Sikhvillage		Borabanda	B.H.E.L	Barkathpura
Tadband		Jublihills	Chandranagar	
Tirumalgiri		Motijinagar	R.C. Puram	
West maredpalli		Sanathnagar		
		S.R. Nagar		
		Yousufguda		

The GHMC is headed by a commissioner who will be a senior IAS officer. As the reorganization of the administrative set up for the Greater Hyderabad Municipal Corporation is likely to take some time and in order to ensure that there is no disruption and dislocation of civic functions, the state government has decided to re-designate the municipal commissioners of the 12 municipalities as deputy commissioners of GHMC. As an interim measure, he said, the erstwhile areas falling within all the 12 municipalities would be treated as administrative zones and the deputy commissioners would be delegated with necessary powers to effectively look after the day-to-day civic functions in their respective zones.



Picture 4-10 Modern Hyderabad



Picture 4-11 Hi-Tech city

Asserting that the state government would not increase the burden of taxes on the citizens of the GHMC, the information minister said that the new municipal corporation would continue with the old area-wise taxation system. City-level systems like a major road network, water supply, sewerage and drainage, urban transport and an environment system, the minister said, cannot be done locally and need to be tackled in an integrated manner by an appropriate civic management structure. Hence, the state government is implementing a Rs 28,000-crore master plan that includes the Rs 5,000-crore 162-km outer ring road (ORR), a Rs 2,000-crore sewerage infrastructure plan and a Rs 500-crore elevated express highway, which are all under various stages of development.

The Hyderabad district is situated on 17020' of the northern longitude and 78030' of the eastern longitude above M.S.L. and on among the world's oldest grey and pink granites. The highest point in the city is Banjara Hills, 2026' above M.S.L. The contour level falls gradually from west to east creating almost a trough near the Musi river which runs through the city. This natural feature facilitates water supply by gravity.

Furthermore, it is characterized by an average elevation between 500-600mts. Being the general slope towards the east, the topography is rugged particularly in the eastern part. Quite contrary, the major part of the district in the east is obviously noticed to have congested settlements under the urban system of Hyderabad. Drainage features of the district include the Musi River as well as Hussainsagar and Mir-Alam-Tank. Geographically, the district shows achaeon rocks specified as cordierite genesis, hora blend-biotite and unclassified crystallines. Soils of the district relate to ustalfs-tropepts. Thus, in view of its physiographic personality as well as its existing land use pattern, the district has been sub divided into

two sub micro – regions i.e. the West – South Hyderabad urban area and the Hyderabad Municipal Corporation.

The chief river of the district is the Musi. It rises in the Ananthagiri hills and flows almost east, passing through the middle of Hyderabad city. Finally, the river joins as a tributary to the great river Krishna near Vadapalli in the Nalgonda district. A reservoir called the Osman Sagar across the river Musi, and another one the Himayat Sagar across the river Esi, a tributary to the river Musi and the Singur dam constructed across the river Manjira, which is a tributary to the river Godavari, are the sources of water supply to the twin cities of Hyderabad and Secunderabad.

The climate of the district is fairly equitable. The emerging of constructions, the rapid industrialization, industrial pollution and the ruthless destruction of trees by M.C.H under the scheme of road widening, make the city hotter and the climate erratic. In the year 1999-2000, the maximum temperature was 39.9°C and the minimum was 14.2° C. The district recorded an actual rainfall of 544.6 mm as against the normal rainfall of 786.8 mm. During the Southwest monsoon the average annual mean rainfall is 390.2 mm; the Northeast monsoon brings 27.3 mm; during the winter period it is 67.0mm and during the hot weather period 60.1 mm.

There is no forest area in the Hyderabad District. As a consequence of the general hot and dry climate the flora of the district shows xerophytic adaptations. Since the district rapidly urbanized, there was no scope for developing forests. It was recorded that during the beginning of 19th century, the district with its low scrubby jungles was home of leopards, bears, hyenas and occasionally tigers while in the more open plains the antelope was found in plenty. Due to rapid urbanization, the forests disappeared in the district. However, there is a famous Nehru Zoological Park spread over 123 hectares. This is one of the biggest zoological gardens in the country. The main object of the park was to provide natural habitation to the various species of animals of wild and mild types, secured and reared by the zoo authorities. There are nearly 1100 animals, carnivorous as well as herbivorous, and birds in large mooted enclosures. The adjoining Mir Alam tank was convened into a charming drive lake for the visitors. The Pre-historic animal park, the ancient life museum, the natural history museum and the lion safari park are some of the attractions.

Hyderabad district is different from other districts of the state, in respect to agricultural activities. Most of the people of the district are engaged in nonagricultural activities i.e. predominantly employees, industrial workers, businessmen etc. Thus the area under agriculture activities is only 142 hectares. The total geographical area of the district is 19,968 hectares, of which the land put to different use. The crops raised in the district are rice on 37 acres, producing 89 tonnes.

The major part of the population in the district depends on the industrial sector. There are 28 large and medium scale industries employing about 23,458 persons; 633 units of small-scale industries are employing 2,600 persons operating in the district. During the year 1994-95 and 1999-2000, 574 factories were registered employing 17,768 workers.

The Hyderabad Metropolitan Water and Sewerage Works ensures supply of water to the citizens of the twin cities and the suburbs. The main sources of protected water supply to the Hyderabad city are the Osmansagar and Himayathsagar, Manjira and Singur rivers. The water is not found to be sufficient for the users. Therefore, bore wells are found in every nook and corner of the city.



Picture 4-12: Singur Dam, water supply to Hyderabad

Hyderabad is rated as A1 city (GOAP and CESS, 2007), with its about 7 million inhabitants. Hyderabad ranks 43rd among the largest urban areas in the world (Demographia, 2009). Out of the total population of the district, all persons consisting 100% of the district population, are treated as urban population, as the entire district is urban, consisting of three towns, i.e., Hyderabad Municipal Corporation, Osmania University, Secunderabad cantonment Board and Cyberabad. Among these four towns, the Hyderabad Municipal Corporation has the largest population. In this regard, the district is ranked 5th. Furthermore, the district has recorded a decennial growth rate of 21.7% against the state average of 14.6%. During the 1961-71 decade, the Hyderabad District recorded a growth rate of 44.7%. Though the Hyderabad District is the smallest one in area, it has recorded a very high growth rate. When we recast the population figures of the earlier censuses with the present jurisdiction, it is seen that the district has all through recorded considerably higher growth rates than the state average during all the previous decades except during 1911-21 and 1951-61. Incidentally, during the decade 1961-71 the district has recorded the highest growth rate of 44.7%. There is an increase in its population by 32.2%, for, as per census 2001 it was with 5.7 million. In comparison to AP, Hyderabad (MCH) has a very high population density (Ramachandriah,

2003 in GOAP and CESS 2007). In Hyderabad city 25 % of the population are migrants as per 2001 census due to advantages for trade/business (GOAP and CESS 2007). Hyderabad is with 79.2% of children in the age group 5-14 (Census 2001). The degree of urbanization is generally measured in terms of percentage of the urban to the total population for all districts. However, the Hyderabad District is purely an urban district. The trend during previous decades reveals that it recorded a higher level of urbanization than all the districts in Andhra Pradesh state. The density of population of Hyderabad district was 17,649 persons per sq.km in 2001. At 1991, also the corresponding figure was 14,497 for the Hyderabad District, which is the smallest district in the state in terms of the area occupying only 0.08% of state area. During the same period, the Andhra Pradesh state increase was from 242 per sq.km in 1991 to 275 in 2001 recording a 13.64 percent increase. Hyderabad being the state capital and industrially developed has a considerably large population forming 5.0% of the state population.

The sex ratio for Hyderabad district is 963 (number of females per 1000 males), lower than the state ratio of 978 females per thousand males at 2001 Census. When compared with other districts, the sex ratio for Hyderabad district is generally not favourable to females and this has been the phenomenon during earlier decades. The possible reason could be the high level of urbanization and male migration.

Coming to the literacy rate, it is defined that a person who can both read and write with understanding in any language is to be taken as literate. A person, who can merely read but cannot write, is not literate. It is not necessary that a person who is literate should have received any formal education or should have passed any minimum educational standard. The district has 78.8% literates. This percentage of literate population is more than the state average of 60.5%. Sex-wise analysis of the effective literacy ratios reveals that male literacy is 83.7% while for females it is 73.5%. District level comparison indicates that Hyderabad district accounts for the highest literacy rate in the state.

The work participation rate in Hyderabad district is 29.2%, which is lower than the state average of 45.8%. Again, the percentage of main workers stands at 27.0% as against the state average of 38.1%. Work participation rates separately for males and females are 47.3% and 9.9% respectively. The low level of work participation rate in Hyderabad is attributed to a very high proportion of non-workers. Among workers, the percentage of cultivators has recorded 1.0 at 2001 Census, while the percentage of workers in the household industry is 3.0. The percentage of agricultural laborers has been recorded as 0.6 at 2001 Census. This low percentage is mainly due to the conversion of agricultural land to non-agricultural land with the fast growing of new housing colonies around the city. Subsequently, work participation rate in the "Other Workers" is 95.4%, because of large-scale industries that are set up in the district which are of national importance and provide large-scale employment for technical persons from within the city and

also outside areas. The overall growth of employment is 2.67%. Hyderabad's growth of employment coincided with the growth of population during 1991-2001 (GOAP and CESS 2007).

The per capita income of Hyderabad has been increasingly steady, particularly during the last decade. Hyderabad is the second with higher per capita GDP of 15,743 preceded by Visakhapatnam with highest as 17,504 GDDP for the year 2005-2006 (DES, Hyderabad used in GoAP and CESS 2007).

Table 4-1: Per-Capita Income of Hyderabad District

Per-Capita Incomes(1993-94 to 2001-02) (1993-94 prices)	
1993-94	7686
1994-95	8238
1995-96	8379
1996-97	9009
1997-98	9774
1998-99	9984
1999-2000	11403
2000-2001(R)	11881
2001-2002(P)	12567
2005-2006	15743

Source: Planning department, GoAP

The demographic and health profile of the district is unique. The district reached below a replacement level of fertility (1.9), the growth of the city is mainly attributed to in-migration. The district is 100% urban and attracts a large proportion of people with employment opportunities.

Around 5 percent of the boys and girls marry before legal age at marriage and mean age at marriage for boys and girls is 25.9 and 21.7 respectively. Over the years, Hyderabad has achieved significant improvement on various health aspects. In an over twenty years period (1985 to 2005) the Crude Birth Rate (30.6) and Crude Death Rate (10.3) declined to 20.7 and 9 respectively. Total fertility rate (TFR) was 1.9 in 2001. Infant Mortality Rates have also shown a steady decline from 83 in 1985 to 23 in 2007 and expectation of life at birth increased from 55.5 to 62.5. The Reproductive Health Index is 978 for the year 2001 (GOAP and CESS 2007).

The Hyderabad District, being fully urban and most of its area forming the capital city of the Andhra Pradesh state, occupies the unique position in providing medical services to the people. There are some hospitals which are since long experienced and well developed in the twin cities. The Osmania General

Hospital, the Gandhi Hospital and the Nizam's Institute of Medical Sciences are some of the most important among the 317 medical institutions. There are different categories of medical institutions, which include government hospitals, dispensaries, nursing homes and family planning centers. The total bed strength available is 5,651, catering to the needs of the urban population. Apart from the above, some specialized hospitals dealing with diseases such as cancer, T.B., mental disorders, chest diseases etc. also exist. The Sarojini Devi Eye Hospital and E.N.T. Hospital are one of its kinds in the country. In addition to the above, certain institutions affiliated to unani, ayurvedic and homeopathic systems are also functioning. The government as well as private hospitals are having family planning centers under their control.

As per health care it has more private facilities that cause an increasing burden to the poor due to the lack of primary health care centres in city (GOAP and CESS 2007). According to the government's policy, there should be one sub-centre for every 5,000 people, one primary health centre for every 30,000 people and one community health centre for every 120,000 people. The district is far short of these requirements. At the same time the National Health Policy 2002 aims to increase the usage of public health facilities from the current level of less than 20 percent to more than 75 percent by 2010. Currently, in the district there are 73 government institutions; 1677 private; 11 teaching hospitals and one district hospital; three area hospitals; three urban hospitals and 53 urban sub centres in the district for the maintenance of health care (GOAP 2006). By the year 1990, public hospitals were losing their place as primary providers of inpatient care and people relied increasingly on private services. Sixty percent of people avoided the government's Health Centres due to the lack of medicines and long distances. Nursing homes and hospitals started coming up and the private sector has become the major source of curative services in urban areas. Slum settlements within the city are totally dependent on private services for treatment. Even in city a substantial section of the poor are served by 'quacks'.

Table 4-2: Health Infrastructure in Hyderabad

S. No	Type of Hospitals	No. of Hospitals	S. No	Type of Hospitals	No. of Hospitals
1	No. of DME Hospitals	12	9	ALLOPATHIC	
2	No. of APVVP Hospitals	4	a)	No. of General Hospitals	2
3	No. of Urban Health posts	60	b)	Hospital for special Treatment	
4	No. of Maternity Centres	5	i	Maternity Hospitals	2
5	No. of Pediatric Clinics (Private)	1200	ii	T.B. Hospitals	1
6	AYURVEDA		iii	Eye Hospitals	1
	No. of Dispensaries	8	iv	ENT Hospitals	1
	No. of Doctors	23	v	Institute of Mental Health	1
	No. of Out Patients	2,50,212	vi	Institute of Tropical Diseases	1
7	UNANI		vii	Women and Children Hospitals	1
	No. of Dispensaries	16	viii	No. of Cancer Hospitals	75
	No. of Doctors	24	ix	No. of Dental Hospitals	1
	No. of Outpatients	4,79,096	c)	No. of Beds	5651
8	HOMEOPATHY		d)	Doctors per lakh	11.25
	No. of Dispensaries	11	e)	Beds for Lakh Population	96.91
	No. of Doctors	16	f)	Total out patients	11,57,165
	No. of Outpatients	4,27,857			

Source: Hyderabad Health Action Plan, Government of Andhra Pradesh, 2005-06.

The organization structure of the District Health and Medical Office is given in the table 4-4. The structure is designed based on functions at the headquarters level. However, the DM&HO is assisted by two deputy DM&HOs along with other program officers for implementation of all programs in the district. An additional DM&HO functions under DM&HO exclusively for the Family Welfare Programme. There are specific programme officers.

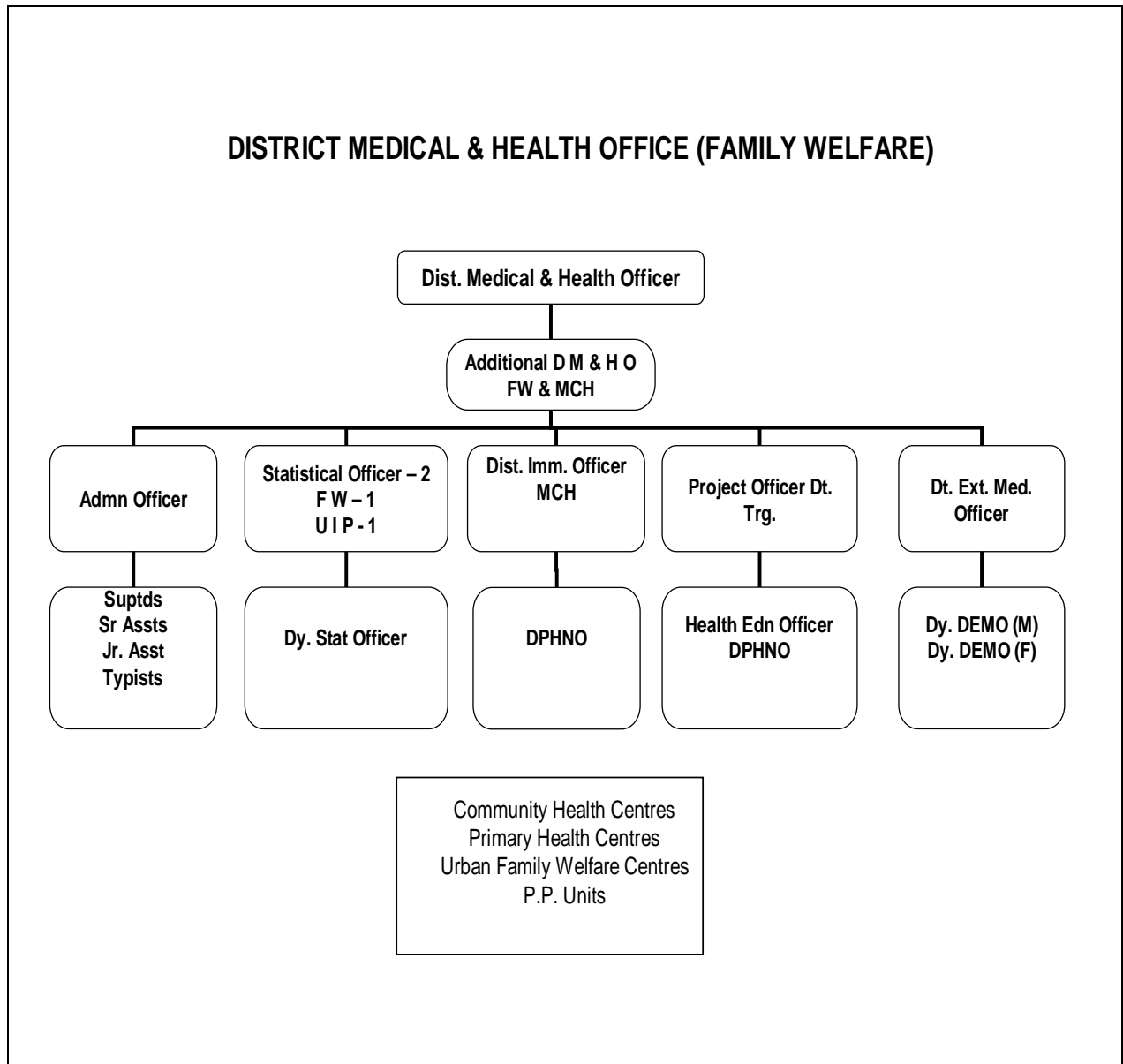
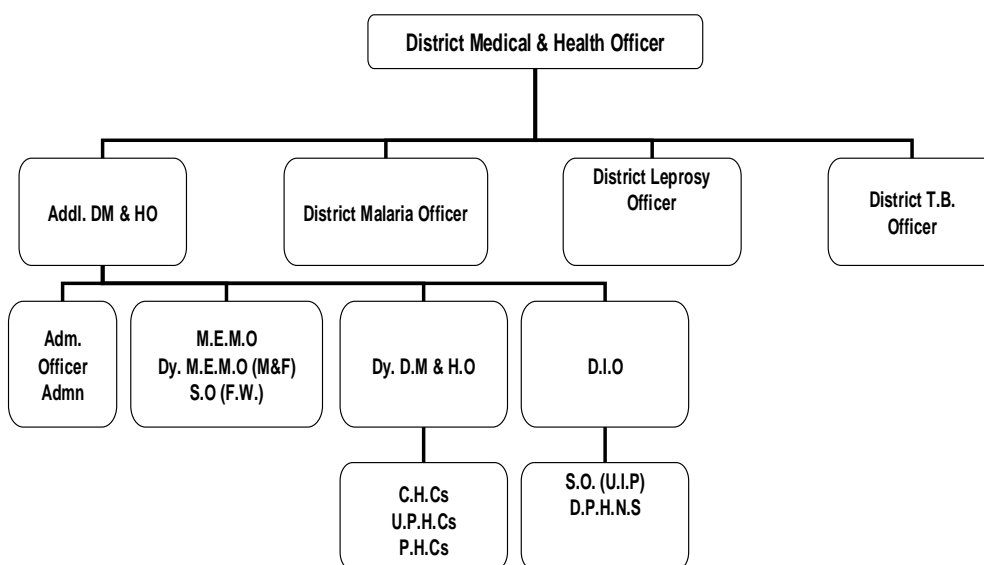
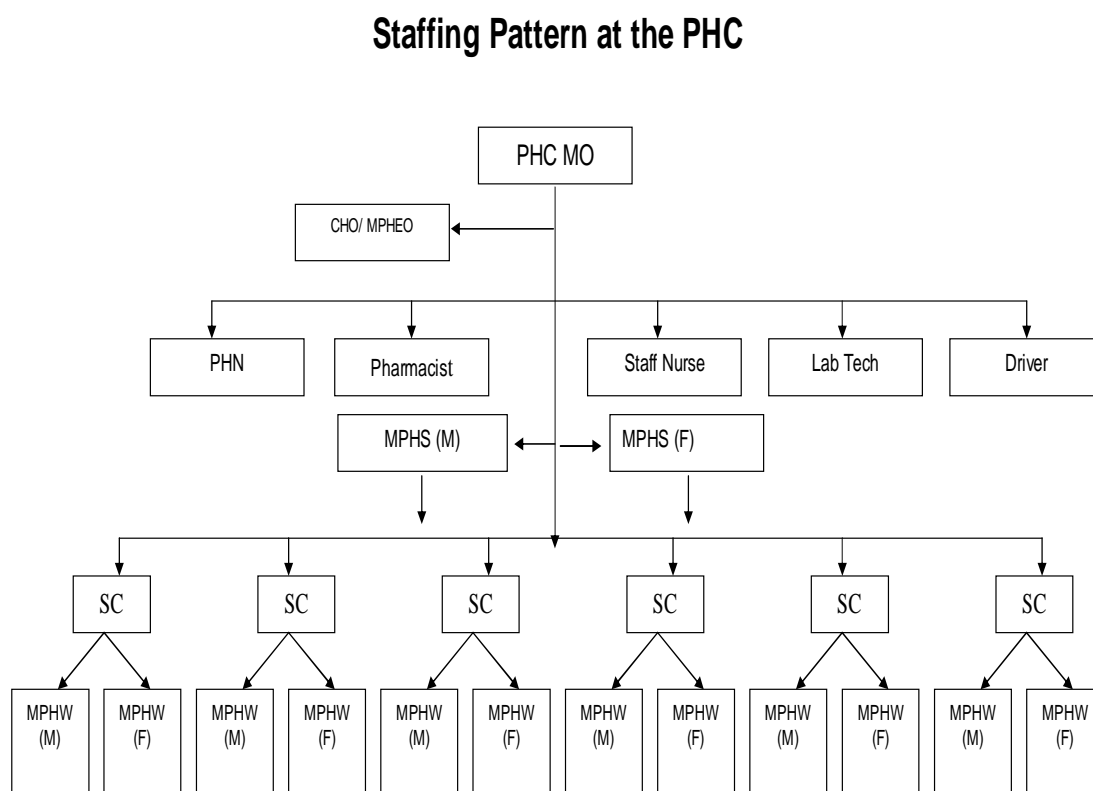
Table 4-3: District medical & health office (family welfare)

Table 4-4: Organisational structure at district level (health)**ORGANISATIONAL STRUCTURE AT DISTRICT LEVEL (HEALTH)**

Source: Functionary Manual; Family Welfare Dept., Directorate of Health;
Published by Dr. MCRHRD Institute of Andhra Pradesh

Table 4-5: Staffing pattern at the PHC

Under NRHM a lot of focus has been given to environmental health; hence different committees on various levels were formed. Convergence and coordination with other departments engaged in improving health and quality of life of women and children. RCH-II project components have been designed with the clear understanding that they will be implemented in close convergence and coordination with other departments and agencies like the Woman Development and Child Welfare, APRP (Velugu, Rural Development) Department, Tribal Welfare Department etc.

The district level committees are interested in monitoring and review of projects implemented by

most social and developmental departments at the district level. Similarly, the district collector is the ex-officio chairperson of the district RCH society. District level convergence workshops involving all connected departments are held from time to time to ensure proper convergence of all departments and seeks cooperation in smooth implementation of project activities. The health department convergences with rural development departments in oral rehydration therapy/acute respiratory infection(ORT/ARI) campaigns for promotion of use of smokeless chullas by the rural people which can considerably help in prevention of Acute Respiratory Infections in infants among the rural poor.

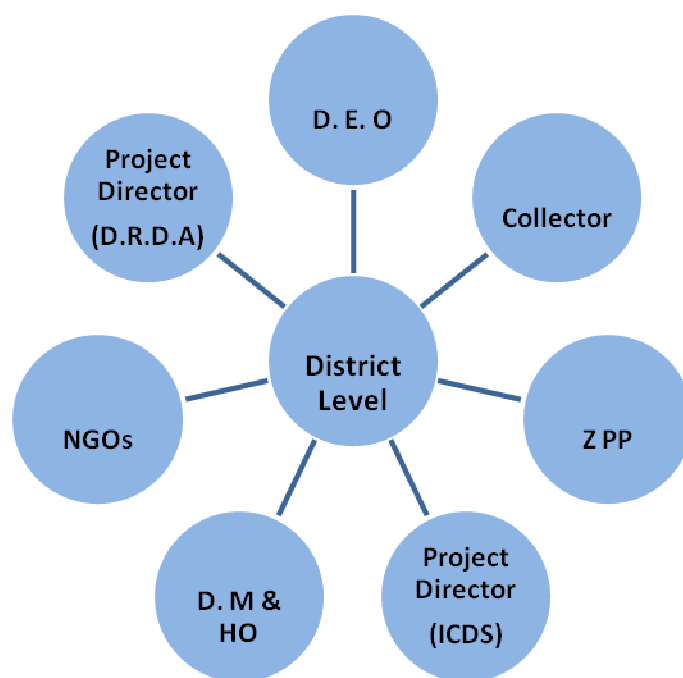


Figure 4-3: Convergence Action Plan at district level

School teachers are being involved in school health programmes. Especially their assistance is taken for health examination of students within schools for identification of any health problems and supports in treatment aspects.

Convergence with Women and Child Welfare Department. Anganwadi workers are responsible for the identification of children with malnutrition and maintaining growth chart and supplementary nutrition to children. They are helping ANM with the immunization of children and with community mobilization. They are involved in other maternal and child health care interventions like creating awareness on adolescent health issues, age at marriage, nutrition and prevention of anemia.

In addition to the above mentioned departments" cooperation of other departments like rural water supply department, revenue departments and municipal authorities are obtained in prevention and

control of gastro-enteritis and diarrhoeas in the district.

Convergence with in the Health Department. The district level committee consists of District Medical and Health Officer (DM & HO) and other program officers under his control. The district coordinator and superintendent of hospitals under the control of Andhra Vydyha Vidhana Parishad (APVVP) meet once in every two months to plan, implement and monitor the RCH-II program in the district for the necessary coordination at the district level.

The decentralization of the health sector to the hands of the state from central level has two perspectives; one to make lower governments responsible for better services and also to see the local needs and preferences; the second focuses on participation of local democracy and implementation of a public policy (Jos Mooij and Sheela Prasad). In AP the Department of Health Medical and Family Welfare consists of various directorates. The three important ones are: the Directorate of Health; The Commissioner Family Welfare and the Andhra Vydyha Vidhana Parishad (APVVP). Primary health care will be taken by the Directorate of Health (Do H), which implements vertical programmes; The Commissioner of Family Welfare looks after family planning, pre and post natal care and immunizations. The APVVP is responsible for the secondary care of hospitals in the districts and at sub-district level (area hospitals and community health centres). The Directorate of Health Care employs all doctors; neither APVVP nor the Commissioner of Family Welfare has its own medical staff. The doctors working for APVVP are the persons on deputation from DoH; the Commissioner Family Welfare implements its programmes through personnel of DoH (Jos Mooij and Sheela Prasad 2000).

In view of financial viability, quality of care in public hospitals and guidance of the World Bank, health sector reforms are introduced in Andhra Pradesh. Of these, the Andhra Pradesh Vaidya Vidhana Parishad (APVVP) emerged in 1986 as an autonomous institution for the management of secondary level hospitals and to grant financial and administrative autonomy to secondary level hospitals. Another reform was launched by the Andhra Pradesh First Referral Health System (which was launched in turn by the World Bank Aid). The aims of the project include introduction of user charges depending on the cost of medical intervention at secondary hospitals and shift in allocations from tertiary to secondary level hospitals. The economic value of people is taken into consideration in the provision of health services. Further, another project supported by the World Bank had been evolved namely A.P. Economic Restructuring Project (APERP) to include reforms in the areas like education, nutrition, irrigation; communications and state administration. As a reform of the health sector this project aims to improve the quality and effectiveness of health services, it has a special focus on accessibility to poorly served population and is integrating primary health care with first referral hospitals that are already under the APFRHS project. The Primary Health Care Project aims at up gradation of primary health care facilities

by renovating buildings, enhancing community participation and including health care delivery through the private sector (GOAP and CES 2007).

The Human Development Index is 0.717 for the period 2005-06; Hyderabad ranks 1st in AP while the state average is 0.537 (CESS and GOAP 2007).

5 Hyderabad in the Context of Global Change: Empirical & Evidence Based Understanding

As discussed in the methodological section, an empirical exercise is carried out in four areas of the Greater Municipal Corporation of Hyderabad (GHMC). These are (a) long standing settlements (Hyderabad Old City - Nizam's era), (b) middleclass settlements of Hyderabad (Gandhi Nagar - represents independence era), (c) lower middle class settlements (Industrial area – Pattancheruvu), and (d) recent settlements (Cyberabad - represents post economic liberalization era). The major findings of the empirical results are as follows.

5.1 Household Characteristics of the Study Population

The study population is composed of 51.0% male as against 49% female population (table 5-1). The age category shows that 3.4% are less than 5 years old, 16.6% are between 6-14 years; 76.9% are aged 15-59 and the elderly, i.e. 60 years and above account for 3.1% of the study population. Marital status of the study population shows nearly half of them (51.6%) are married, 44.4% are unmarried and 4.2% are widowed or separated.

Religion wise, Hindu populace comprises 63.0%, Muslims 26.5% and Christian 10.5%. The social category of the population reveals that around one-quarter of the total population belong to the lowest order: scheduled castes (21.5%) and scheduled tribes (2.5%). One-third of the people belong to backward castes (31%) and general caste (27.5%) groups. Around 17% of the people do not fall under any caste. A caste is a subcomponent of Hindus; often the other religious groups do not wish to be associated with a caste category. At the same it has to be noted that few of those originally being Hindus, subsequently have converted to another religion but they still would prefer to be associated with a caste.

Educational status of the study population reveals that nearly 14 out of every 100 persons are non-literate; on the contrary 31 out of every 100 persons have studied up to graduation or above. This contradictory situation indicates the diverse category of population in the state capital of Hyderabad. Of the remaining literates almost 10% have primary level of education, i.e. 1-5 years of formal schooling, 29% have 6-10 years of formal schooling and around 15% completed 11-12 years of formal schooling.

Table 5-1: Household characteristics of the study population

Characters	Percent	Characters	Percent
Sex		Religion	
▪ Male	51.0	▪ Hindu	63.0
▪ Female	49.0	▪ Muslim	26.5
		▪ Christian	10.5
Age (Years)		Caste	
▪ ≤ 5	3.4	▪ Schedule Caste	21.5
▪ 6-14	16.6	▪ Backward Caste	31.0
▪ 15-59	76.9	▪ General Caste	27.5
▪ 60+	3.1	▪ Schedule Tribe	2.5
		▪ Not applicable	17.5
Education (Years of Formal Schooling)		Main Occupation	
▪ Illiterate	14.2	▪ Household worker	21.4
▪ 1-5th	10.3	▪ Labour/ Unskilled worker	10.3
▪ 6-10th	29.4	▪ Skilled worker	9.9
▪ 11-12th	14.5	▪ Businessmen	4.1
▪ 13-15th	18.6	▪ Professional	6.6
▪ 16+	12.9	▪ Office work	7.1
		▪ Dependents	40.7
Marital Status		Migrated to City	
▪ Never Married	44.4	▪ Non-migrants	24.5
▪ Currently Married	51.6	▪ Migrated	75.5
▪ Widowed/ Separated/ Divorced	4.2	▪ Number of years ago migrated (Mean)	14.34 years
Wealth Index		Standard of Living Index (Health perspective)	
▪ Low	18.0	▪ Low	33.3
▪ Medium	56.0	▪ Medium	65.7
▪ High	26.0	▪ High	1.0
Total Households - 200		Total Population - 789	

Source: own survey

When we look at the occupational status of the study population, a majority of the population is economically dependents (62.1%); 21.4% work in households and 40.7% are elderly and students. Of the remaining, 10.3% are occupied in unskilled work; 10% are skilled workers; 4% are engaged in business, 6.6% in professional and 7.1% in office related work.

Hyderabad has been one of the fastest growing cities in the country, mainly being an attractive city for in-migrants. The study population reflected that three-fourths (75.5%) of the habitants are in-migrants. Caution is required for understanding the definition of migration. The interpretation of the definition of migration by the respondents reveals that even if a household have migrated over 2 or 3 generations ago, the household members call themselves to be migrants. One of the main reasons for migration is the economic deprivation at the place of origin. The chief reasons articulated by the people are: search of livelihood (23.0%), better opportunities (24.5%), work/job (23.0%), marriage and other reasons (1%). The

wealth index shows 26.0% populace are high income people, 56.0% are middle income groups and 18.0% belong to the low income groups.

Hyderabad, being the 43rd largest urban area in the world reflects that it is one the fastest growing cities in the world. Paradoxically, a substantial percentage of people in the city are prone to environmental hazards as 14.5% are non-literate and furthermore 49% of females and 18% of men belong to the low wealth index group.

5.2 Basic amenities

5.2.1 Particulars related to housing conditions

These particulars found while 74.5% populace are living in Pucca houses, 23% are living in kutcha houses and 2.0 persons living in huts (table 5-2).

Table 5-2: Basic amenities: particulars related to housing conditions

Particulars	Percentage
Type of house	
Hut	2.0
Kutcha	23.5
Pucca	74.5
House on Land that is	
Authorized	89.5
Un-authorized	10.5
Main source of lighting for house	
Proper connected electricity	96.0
Illegally connection	4.0
Mean no. of rooms per household	3
Having a separate room for kitchen	57.5
Having one window for room	75.5
Having adequate natural lighting	79.5
Having adequate fresh air flow into the house	83.0
Total no. of households	200

Source: own data

Populace living in kutcha houses and in huts in the vulnerable segments, reflect their poor financial background. Further the 89.55 houses are built on unauthorized land and 10.5% on unauthorized land. Source of electricity for the houses for 96% of the population is through legal connections. However, 4% of houses are connected with illegal connections. Often facing the risk of short circuits and related problems have a direct or indirect bearing on health. While the mean number of the rooms per houses for the study population is 3, 57.5% houses are with separate kitchen, 75.5% houses are with one window per room, and 79.5% houses are with adequate lighting. 83.0% of houses have adequate fresh air inflow.

Houses having no separate room for kitchen are highly injurious for the health in view of indoor pollution. The inhabitants face related health issues as asthma and allergies due to heat, whereas women and children are more exposed. Few of the narrations on living patterns reflect the level of affordability versus quality of the house in which one lives:

“The house rents in the city have increased rapidly. As per rules the rent of a house has to be increased only by 5% annually. Who is there to control? The owners increase the rent erratically. We are left with no option either to increase as per ht demand or vacate the house and comprise for a smaller unit”

“We cannot afford to pay the rent for a proper house, so we live in unauthorized land. Even here we are required to pay rent to the leader”

5.2.2 *Availability and Quantity of Drinking Water*

Table 5-3 shows that 84.5% are provided with piped water as the main source of water, 12.5% are dependent on mineral water and 3.0% are dependent on water tanker supplied by the government in certain places. 18.0% of the respondents stated that they are supplied with water every day as against 82.0%, which do not get water daily from GHMC. Measures adopted to purify water for drinking purpose include straining by cloth (38%), use of mechanical filter (4.0%), boiling (2.0%) and use of electric purifiers (7.0%). About 9.0% of households remain without any measure.

80% of respondents held that they are provided with adequate water supply in other words 20% responded that the water supply they have is not adequate for their needs. When asked about the quality of water, 86.5% said that the water they get is potable and 13.5% said it is not. Reasons given by people for the lack of quality (not potable) are: chemical contamination (5.5%), fluoride contamination (0.5%), sewerage contamination (3.0%) and unbleached (3.5% of respondents). Our present findings nevertheless correlate with other studies. Only 18% of people get daily water supply from GHMC. It is alarming to find 82.5% still not getting water supply daily. 3.0% are dependent on tank water. 20% of people still do not have adequate supply of water. 56.5% are not supplied with water in summer season. 10% are not supplied with safe water.

Table 5-3: Basic amenities: availability and quality of drinking water

Particulars	Percentage
Source of drinking water	
Piped water	84.5
Mineral water	12.5
Tank water	3.0
Frequency of supply	
Daily	18.0
Not daily	82.0
Water safe of drinking	91.0
No supply in summer	43.5
Quality of water	
Potable	86.5
No Potable	13.5
Measure adopted to purify drinking water	
Strain by cloth	38.0
Water filter	4.0
Boiling	2.0
Electric purifier	7.0
Nothing	8.5
Adequate supply of water	80.0
Total no. of households	200

Source: own data

5.2.3 Particulars Related to Sanitation Facilities in and around the House

82% of households have proper drainage facilities for kitchens; 91.0% have drainage facilities for the wash rooms (table 5-4). It is a concern that nearly one-fifth of the households do not have a closed outlet of drainage facility for the kitchen and almost one out every ten households do not have a closed outlet of drainage to the wash room. It discloses the lack of basic sanitation facilities in the city and is a serious concern. The civil works department of state has to immediately initiate measures to construct closed drainage facilities in all the colonies.

Table 5-4: Basic amenities: particulars related to sanitation facilities in and around the house

Particulars	Percentage
Having proper drainage facility	
Kitchen	74.0
Wash room	91.0
Type of drainage facility	
Open canal	16.5
Closed sewerage	82.0
Closed but leaking	1.5
Method of disposal of household garbage	
Collected by any agency	52.0
Dumps in garbage bin	37.0
Dumps out side house	11.0
Garbage in the colony	
Yes	69.0
No	31.0
Household toilet facility	
Own toilet	88.0
Shared toilet	11.5
Others	0.5
Total no. of households	200

Source: own data

As to the type of drainage facility, 16.5% is through open canal. 82.0% of the households interviewed have a closed drainage system but 1.5% with leakages in the closed drainage facility, therefore becoming a breeding ground for parasitic infections. The disposal of household garbage is with 52.0% collected by some agency, in 37.0% public dustbin are used and 11.0% are disposing their garbage outside of the house, which pollutes the surrounding environment. Still, it is strange to know that 69% people stated that there is still garbage in their area even though the data finds 89% of households using some or other (52% private agency and 37% public dust bin) garbage disposal. Common toilets/ shared toilet facilities are used by 11.5% and other sort of toilet facilities are used by 0.5%, which might be a source of several infections, such as urinary infections.

Open canals in Hyderabad are a big question for the promotion of health. Diseases like dengue, malaria and viral fevers spread in open canals. Ameerpet and Barkathpura are notorious for the leakages in the sewerage on the main roads of Hyderabad itself. Many of the fast foods centres are situated near by the leakages. Neither food inspectors nor the GHMC people are bothered for the health and hygiene of public.

5.2.4 *Pollution*

Air pollution in places like Panjagutta or Ameerpet is causing severe health hazards due to vehicular pollution. Vehicular pollution is the major source of air pollution. The common pollutants are sulphur dioxide (SO₂) nitrogen oxide (NO₂), suspended particular matter (SPM), hydrocarbons (HCs), carbon monoxide (CO), lead (Pb) etc. The focus group discussions and in-depth interviews, carried out in the city, revealed that often people return home with headache, soar throat, burning of eyes and headache. Also problems are coupled with an increase in numbers of vehicles and driving irregularities on roads.

Another issue, coming up during discussions, are the problems related to noise. This was particularly mentioned by elderly persons. One emotive expression was “It has become fashion for the youth to play music loudly. Many times I feel a loss of pulse and my heart stops.” Another aggressive outburst was “These days none care for others. On roads we hear nothing but the horns of the vehicles.”

5.2.5 *Life Style Particulars Related to Food Habits*

Three out of four persons (74.8 %) have changed their food habits after coming to Hyderabad (table 5-5). Regarding breakfast, 46% of interviewees said that instead of traditional meal they are taking specific breakfast (such as Idli, Dosa, Upma, Vada), 16.0% shifted to western breakfast (baked bread, butter and egg) and 2.5% to junk food (samosa/ bajji/ fast foods).

Unlike a shift in the type of breakfast consumption by a majority of the people, a shift from a previous type of lunch is reported by only 6.5% of households. The majority preferred to eat home cooked traditional food for lunch, those who shifted relied on fast foods centres or hotels. Nearly four out of ten persons (39%) developed taste for spicy or oily food from hotels (33%). Interestingly, a marginal percentage of city inhabitants became conscious of health, hence preferred to have either fruits or oil light diet for dinner (6%).

Table 5-5: Life style - particulars related to food habits

Particulars	Percentage
Percent perceived to have Migrated to Hyderabad	75.5
Food habits changed due to migration	74.8
Breakfast	64.0
▪ Instead of traditional meal shifted to specific food taken for breakfast	46.0
▪ Shifted to western breakfast	16.0
▪ Shifted to junk food	2.5
Lunch	6.5
▪ Shifted to fast food/ hotel food	6.5
Dinner	39.0
▪ Shifted to spicy/ oily food from hotels	33.0
▪ Healthy food	6.0
Food taken between meals	59.0
▪ Fast food	38.5
▪ Beverages	19.0
▪ Healthy habits/Fruits	1.5
Skips Breakfast due to pressure of time	87.5
▪ At least once a week	53.5
▪ 2 or more times a week	34.0
Meals not taken at regular timings	49.0
Total no. of households	200

Source: own survey

The consumption of addictive beverages became an acceptable practice to three fourths of the urban inhabitants. 76% of interviewees prefer tea or coffee in the mornings and in many instances this replaces breakfast. These practices are increasing health risks in the urban life. Further, the study revealed that 87.5% of respondents miss their breakfasts. 53.5% skip it at least once, 34% at least twice or more times in a week. This is mostly due to work pressure or hurry to reach the work place (57%). Around one-fourth expressed lack of time (23.5%), 2.0% do not want to have food in the morning; 2.5% cannot afford to have breakfast due to lack of money, 2.5% often go on fast for religious reasons. Further study found that more than half of the persons (53%) who skip breakfast are working for earnings, 31.0% for non-earning, 2.5% are students and 1.0% belong to the elderly.

59% are having beverages between the meals due to their urban life styles/work, which is a typical urban feature and has a bearing on health. On the other hand, only 1.5% is taking fruits/healthy foods between the meals which shows their poor status (table 5-5). More so, fruits /salads act as antioxidants, which are essential for people who expose themselves to the sun and do more strenuous work. In fact, more awareness in this regard is needed. Earlier, as per conventional wisdom, people used to have fruits available in the season. Now poor people cannot afford to buy fruits, children want them as juice or they prefer to go for juices like “maza” fruit juice available in the market. Women are mainly busy with their work and neglect their health. Further only 11.5% are taking salads, 4.5% greens and 23% butter milk and

oil free items in their dinner. These are healthy foods essential for urban life. 94.0% are having rice/chapathy but not mercenarily with healthy and oil free foods.

Having food at irregular timings is a practice often associated with life style. 59.0% of the interviewees responded that they do take food between the meals; 38.5% are taking fast foods, 19.0% are taking beverages and on the contrary 1.5% preferred taking healthy food such as fruits. When asked for the reasons for not having food at regular intervals people gave the following reasons: 68.4% said that they do not have time for taking food, 26.5% are pressurized with official work or meetings. On the contrary 8.2% openly admitted that their earnings are not adequate for them to afford a meal regularly. On the other extreme 7.2% people wished to deliberately avoid taking food as they preferred to maintain body weight and give importance to beauty. Nearly one-third (32.7%) attended night shifts hence the work do not permit them to have food at regular intervals. One out of ten women (11.2%) preferred to have food along with the spouse hence they wait until the husband returns home, often he reaches home not by a fixed time. Again 11.2% of the women tend to take care of either children or elderly at home and often do not maintain regular timings to have food. In one-fifth of the households the members often are not able to take food at regular intervals due to domestic disturbances, a reflection of mental health status of the urbanites. The following comments elicit the situation.

“Both of us need to work and return home late. My husband never understands the situation. He often blames me for everything”

“Man is the head of the family. Just because she earns should she ignore her responsibilities as a wife or a mother? I shall not tolerate if she questions me”

“We have come all the way from the village to earn and clear debts made in the village. He doesn’t contribute a penny. He takes alcohol every day. How far can I bear the expenses of the house? I am tired of him.”

Further, the study attempted to understand whether one is able to have adequate quantity of food as one needs. While the majority (82.5%) admitted that the quantity of food intake is adequate, among those who expressed inadequacy startling variations are observed by age and economic dependency. Among them were the group of the elderlies (40.5%) followed by 17.5 % of youth perusing studies and 16.5% of non-earning persons particularly women, mentioned.

5.2.6 Seasonal Adaptation to Food

Food is a basic necessity for survival and health. Traditionally as well as with the advances in nutritional science it is accepted that the type of food in-take is required to go along with a season and that in turn determines the health of an individual. Hence an attempt is made to find out about related particulars by

asking them about seasonal food-habits/food drinks people traditionally used as an adaptation to extreme weather or seasonal changes and its impacts on health. Respondents from the sampled households mentioned that prior to migrating or settling in the city they followed traditional wisdom: In summer, children and elderly were usually served with butter milk, coconut water, lemon water, Ragijava (porridge), or Barley water. Children were served with sprouted cereals/pulses and water-based fruits such as water melon etc. The youth is also advised to take butter milk. In many households these were usual practices. They are advised to avoid oil based food during meals. Even among the non-vegetarian households, during summer certain meat products were prohibited, preferably vegetarian based food was cooked. In the rainy seasons, the vulnerable persons of the household, particularly children and elderly were served with warm food. Special care was taken regarding drinking water; efforts were made to filter before consumption. Cool drinks were avoided; oil free food was served. The elderly people were served jower roti and they increased the consumption of nuts, putnalu (fried pulses). Often warm beverages or homemade herbal concoctions were served against throat infections. The youth was advised to avoid taking food from hotels. The consumption of chicken was avoided as it was believed that during monsoon season there is a possibility of having viral infections with in-take of country chicken. In the winter, children and elderly were usually served with jower roti, ragi java (porridge), oil based food and in general food was served hot. Food items like ice cream and chilled food was avoided.

Further when asked whether they have been continuing the traditional wisdom of seasonal food habits, many have altered; often away from seasonally nutritive food habits to the consumption of junk foods. In earlier times, seasonally in-take of certain local fruits, vegetables and certain natural herbs derived from local markets.. Even poor and lower middle class families could afford these food items as they were locally available in plenty. Due to migration to urban areas many households have less purchasing capacity. However, the present study found good traditional habits as taking jower roti in winter season, ragi water in all seasons and barley water and butter milk in summer. Furthermore, habits of consuming locally available seasonal fruits like munjalu and melons were found.. Of the total study population only 15% could continue to take seasonal best practices of food in-take as against 64% were not able to further practice the tradition of consuming season-based foods when they moved to Hyderabad. Some of their reflections are as follows:

“Here we have come to earn some money and save for some for our daughter’s marriage. How can we spend on luxurious food? In the village fruits are available in courtyard. We cannot afford this.”

“Costs of living are so high, how can we afford to take fruits or salads. To spend on education is a priority”

“During our childhood we could not get an opportunity to have chocolates, burgers, cakes. I do not want my child be deprived of little pleasures”.

“I cannot spend time for cooking like a housewife. Hence I buy food from shops. Whatever is available within our reach of pocket I buy”.

Again with changes in the market economy, attractive food items are made available in plenty in urban areas. These food items, not always healthy, have become life style habits in urban areas. Hence, body adaptations to new changes as taking of cool drinks, fast foods as snacks though seem to satiate the mind that is not conducive to good health. The oil being used in commercial shops and fast food centres is of poor quality. Especially children now are left to market care due to working parental situation. On the other hand poor control of food and sanitation departments on the market foods propel people at the mercy of poor quality to consume ready-made food available on the markets.

Naturally, the human body is to a large extent adaptive to the affects of extreme weather conditions. Earlier man used to have adaptation in a natural way and also that these adaptation didn't affect the nature. Today's adaptive mechanisms are contributing to global warming, e. g. with the use of electrical appliances such as fans, air-conditioners and refrigerators to beat the heat. In fact, global warming is not only increasing the temperature of summer days, but day heat in other seasons are becoming scorching, irritable, and intolerable for human health. Thus, busy urban life demands such adaptations that give people immediate relief. But again, the use of aerated cool drinks that are preserved in plastic bottles, polythene covers/plastic glasses of tea served in fast food centres are again causing pollution. It is high time to go for traditional/alternative mechanisms that are conducive to human health and environment.

5.2.7 *Life Style – Addictions*

A majority of the household members of all age groups (90.7%) are addicted to watching television, 5.8% take pawn and 6.0% take gutka; 19.1% are for smoking and 12.4% consume alcohol. Almost one-third (29.0%) have realized that their addictions are disturbing their daily routine and has impacts on health (36.0%).

4.5 % are facing health problems with their throat. Chewing pawn and gutka leads to oral cancer. Gutka also consists of a kind of element that intoxicates the body and mind of people. At a point of time there was an attempt by the government to ban gutka but it was futile. Hyderabad is famous for gutka consumers. They not only chew these pawns and gutka, they as well spit irresistibly on roads also from moving vehicles and thereby causing lot of pollution.

90.7% claimed that they themselves accept TV watching as being an addiction. Watching TV for a long time may affect the health of eyes, day work gets disturbed and people habituate to go late to bed, get up late and thus it overall affects the food intake times and evokes the skipping of breakfast and causes irregularities of the times for food intake. This aggravates stress and tension of the urban life.

5.2.8 Availability, Accessibility and Utilization of Health Care Facilities

The present study found that availability of health facilities is not an issue for urban areas. 93.5% of households mentioned that at least one health facility, usually a private facility, is located in their area. The mean distance from a residence to a health facility is 1.8 kms. 6.5% of respondents have to travel more than two to three km to reach a facility. Interestingly 5.0% do not know where to go during illness. More than half of the households (54.5%) goes to private clinics/hospitals if they fall ill. Nearly one-fourth of them (27%) go to public health clinics/hospitals, 12.5% go to quacks/self medication. Despite an exhaustive planning of health services it is depressing to realize that still one out of every ten individuals are depending on quacks for health care. Dependency on private clinics/hospitals indicates the less availability, accessibility and credibility of public health services. Often people in urban areas go to private clinics/ hospitals for saving time and in expectation of courteous behaviour of service providers. In the process at times people have been compromising quality of medical treatment. Some of their comments related to it are

“Going to public hospital means spending a whole day of waiting and I cannot afford to spend so much time. Even if we decided to spend time, ultimately one need to buy medicines by oneself. Rather I prefer a private clinic’

”The doctors are indifferent at government hospitals. Nurses are rude. I prefer private hospitals”

“For surgeries one can go to government hospitals as it costs much, but for fevers or other problems it is better to visit private doctors as it is convenient”

At the same time it does not mean that all can afford private health care, which is more expensive. 73% said that they are meeting their expenses from their savings and the remaining have to borrow money. Of those, 50% are borrowing from relatives and friends, and 14.2% are dependent on private lenders. 2.5% are taking loans from institutions and one out of every 100 persons are required to dispose their property/assets to meet the medical expenses that are beyond their affordability.

During the past one year, 63.5% responded that one or more persons in the household suffered from one of the following diseases: typhoid, malaria, jaundice, gastroenteritis, breathing problems, allergies and fever. It suggests two-thirds of the community suffered from water-borne and air-borne diseases; all the more it suggests the need for environmental health care. Some of the breathing problems and allergies are perhaps related to environmental pollution/air pollution related to chemicals/dust in the city of Hyderabad. Other diseases that are not traced in the study may be due to causal factors in the urban life styles.

5.2.9 *Preventive health care*

Less than half of the population goes for preventive health check-ups. Even among those, who go for preventive general health check-ups, there is a distinctive differential by age and sex: 40% of men, 36% of children, and 27% of women go for checkups. 27% said that their employers take care of their preventive health. For the rest this is not applicable.

In principle, the employers are responsible for the health care of the workforce. Care is not just the reimbursement of medical expenses, it is also preventive. It is depressing to know that 83% of population do not foresee that they may go unwell. This also suggest their lack of understanding on preventive health care. Further workforce not only means that employees go outside the home and work in an office or elsewhere. Work also includes domestic work and taking care of household members. Lack of adequate rest leads to physical and psychological burden that gets cumulated and if affecting health, one has to pay the price; perhaps as costly as one's life. Hence occasional daily care /checks are advised. Only one-fifth (21%) of the adults take self care by going for a walk, yoga and are eating healthy. Only 26% of children are involved in physical activity, suggesting an alarming signal about the health status of the future generation. It illustrates that the fastest growing city is in a paradox of development without the demographic dividend.

6 Policy Implications

- Despite reaching below replacement level of fertility, the growth of population in Hyderabad is largely attributed to in-migration. Measures to prevent in-migration are necessary, otherwise in Hyderabad may experience huge slum dwellers like Mumbai and Kolkata.
- One-fourth of the populace live in kutcha or huts; they often get affected by extreme climatic conditions; roof leakages during rains, floods, fire accidents during summer etc. Some houses are built near sewage canals and occupied on unauthorized lands that might flood even when small rainfalls occur. Care by the government authorities is needed, particularly on rehabilitation policy
- People living near open canals prone to foul odor that pollutes air and causes respiratory problems. Canals promote mosquito breeding, in turn causes malaria. Other waterborne disease like typhoid, jaundice, gastro enteritis are rooted in poor sanitation and housing.
- Supply of water in terms of quality and equity should be the prime focus as adequate and safe drinking water prevents many diseases.
- One-fourth of the households (26%) do not have proper drainage facility for kitchens and 9% for washrooms. These figures are no less to pollute the environment to a great even. Even in localities where a drainage facility exists, often leakages and flooding into streets is a common experience of the citizens. Manholes often are hazards to the public due to negligent repair works and half done works. Open drainage systems and drainages cause diseases as dengue and viral fevers. Merely inclusion of environmental cleansing measures in programmes and allocation of untied funds under NRHM to cities is of no use unless effective measures are taken for implementation.
- A policy should be formulated to take action against owners of houses and commercial establishment as well as maintaining authorities of roads with regard to the leakages in the drainages.
- Measures for the provision of toilets for each house and improvement of the public toilet system and proper maintenance are suggested. City public toilet systems are horribly maintained except in some areas maintained by private facilities. People (individuals, civil society and government) need to be taught in regard to four aspects: 1) Environmental protection by proper disposal of domestic, commercial and industrial waste, prohibiting use of plastic, minimal use of water per capita ;2) Nutritive care with proper breakfast, lunch and supper, more intake of fresh water, buttermilk, salads, required proteins and fppd rich in vitamin c. Less intake of beverages as tea /coffee is recommended; 3) Penalizing people taking gutka, pawn and alcohol, smoking by direct or indirect taxes; 4) Increasing the role of local governments/ MLA's/leaders in getting things

done regarding environment, amenities and sanitation; also civilians should seek local leaders to solve the environmental health disturbing problems.

- In view of above issues the state should make special regulations. Particularly on prohibition of the use of polythene by taking responsibility to promote industries that manufacture eco-friendly covers for domestic and commercial use.
- Hyderabad that is estimated by recent census 2010 (that is still in process) is nearly 1.2 million vehicles are in use and out of these 70 thousands are autorickshaws. Very often pedestrians are involved in accidents. When it rains, traffic problems are multiplied due to improper roads. Moreover encroachment of roads by small vendors is another problem. As per rules, roads have to be repaired in the month of December and January but there is constant repair work. Ameerpet, Borabanda, Himayath Nagar, Mehdipatnam, Secunderabad station road, at times Uppal road are places with more traffic jam. The very few subways are hardly used by the public to lessen the burden of up way traffic. Moreover these subways are unclean and show sanitation problems. People also perceive trespassing through these areas as unsafe. The government too does not ensure cleanliness or safety.
- Traffic and traffic pollution problems may be minimized by constant checking of vehicles, and regulation of traffic during peak hours.
- A regulation against sale and manufacture of liquor is need urgently. On the contrary, the government recently issued licenses to many outlets for sale of liquor for want of exchequer. On the contrary it is not in the interest of public health.
- Alternative campaigns in favour of the promotion of the Gandhian principle of eradication of liquor need to be taken up by conscious citizens.
- A regulation is needed to design the work load of the private and the IT sector in view of the changing disease profile of the middle classes where they often suffer from certain non-communicable diseases as diabetes, cardiac arrest, cancer due to stress at work even at the age of 40 years.
- Provision of adequate health facilities is a primary step towards provision of health care accessibility.
- Unqualified quacks are to be severely punished and measures are needed to curtail them from practicing as health care providers.
- Public-private partnership in health care is another initiative in view of raising medical and health expenditure that is not within reach even for an upper middle class populace. Hence measure to regulate the prices of health care delivery is to be applied in all private hospitals.

- It is sad to find that preventive health care by employers is only 27%. Care for occupational hazards for factory workers, though exists private management, is selfish and even public personnel that are recruited as factory inspectors are corrupt in several cases; construction workers are grossly at loss due to illness/injury and death Preventive care is a gender issue too as many women do not go for checkups even after clinical diagnosis. Social education and counselling is suggested by several social organizations and feminist groups.
- Efforts to create an enabling environment in the context of socioeconomic, institutional development is the need of the hour.
- Enhancing the multisectoral approach through institutional governance structure is required.
- Urban planning also should aim at sustainable management of sanitation and water supply, promote equity in provision of services energy efficiency in transport and buildings, optimal planning solutions in terms of locations, distances and spaces which will reduce noise and air pollutions.
- Policy implications to increase public expenditure in health are needed to ensure a healthy future.

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