



THE URBAN FOOD SYSTEM OF BANGALORE, INDIA

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OF BANGALORE, INDIA

ADITI SURIE AND NEHA SAMI

SERIES EDITOR: PROF. JONATHAN CRUSH



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AUTHORS

Aditi Surie is Senior Associate – Economic and Human Development at the Indian Institute for Human Settlements, Bangalore.

Neha Sami is Senior Consultant – Academics and Research at the Indian Institute for Human Settlements, Bangalore.

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1. INTRODUCTION

Bangalore is located in Southern India on the Deccan Plateau (Figure 1). The city has existed for more than 450 years, although it has few physical markers or sites that indicate its age and antiquity (Nair 2005: 27). The earliest settlement on the present site was probably a small community that acted as a node for the trade of agricultural surpluses from the surrounding region and, as it grew, the settlement was controlled by successive kings from different dynasties (Nair 2005). Bangalore's history was marked by two significant political developments: the Vijayanagara Empire in the 1500s and the British Empire in the 1800s. In the 16th century, under the Vijayanagara Empire, Bangalore began to grow into a significant fortified settlement and market town. The city's foundation lay in its *petes* (or markets in Kannada, the local language) which were largely located in the southern part of Bangalore. The original *pete* streets – Chickapete Street and Doddapete Street – formed the heart of commercial and social Bangalore, and continue to be central to the city's culture and commerce. The system of tanks and bunds that provided a regular supply of water to the city also dates back to these early settlements, which the British later continued to develop (Nair 2005).

Bangalore gained regional dominance during the British Empire as a military or cantonment town in the 1700s. The presence of the British military had a significant impact on the economic and social structure of the city. While the older trading areas of the city were under the control of the erstwhile royal family, the northeastern parts of the city were developed by the British (Kamath 2006). This led to the development of new neighbourhoods, job creation, and increased trade for both the old and new parts of the city, as well as the growth of social infrastructure including housing, hospitals and schools to support the British military. Markets, too, featured heavily in the British plans for the city. Governance in the cantonment areas fell under the British administration, with the rest of the city under the Mysore Kingdom. The two densely populated commercial areas were distinct and contained separate bus and train depots and markets (Nair 2005).

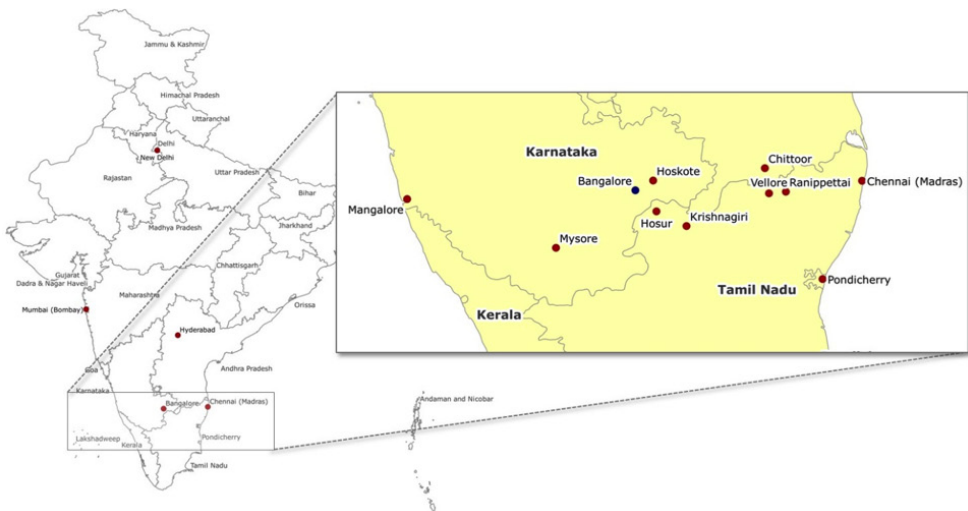
The patterns of urbanization that emerged from both forms of control – the British and the royal families – shaped current-day Bangalore. The old city, for example, continues to echo earlier economic activities in its physical layout and design as well as in the kinds of economic activities that take place there (Nair 2005). Even after Indian independence, researchers writing about the city saw Bangalore as rural in heart and mind. The dominant image of Bangalore until the 1970s was that of a “modest-sized” state capital, although a site of vital public sector initiatives. Today, Bangalore is perhaps one of the fastest-growing Indian cities: over the past two decades its spatial footprint has more than doubled, the

population has rapidly increased, and the economy has changed. With no natural features restricting its development, Bangalore's spatial growth patterns are characterized by urban sprawl. A scale comparison of Bangalore with other comparable megacities in India reveals that it is the city with the largest spatial extent of urbanization (IIHS et al 2013). The city's footprint increased by over 100% from 1992 to 2009 with a 134% increase in the built-up area, accompanied by a sharp decline in water bodies and natural vegetation (Census of India 2011, IIHS 2009, Ramachandra and Kumar 2009).

Bangalore is now the fifth-largest urban agglomeration in India, and the capital and primate city of the state of Karnataka in terms of area, population and economic output. Although it accounts for only 0.4% of the area of Karnataka and about 16% of the total population of the state, Bangalore has the highest district income in the state, contributing approximately 34% to Gross State Domestic Product at current prices and is a magnet for investment and employment in Karnataka (Directorate of Economics and Statistics 2011).

This report provides an overview of the city of Bangalore (officially Bengaluru) focusing on demography, spatial and physical growth, and governance structures. Although the focus is largely on food-related issues, it also provides a larger contextual picture of the city's evolution. While there is currently little detailed information available about Bangalore's food economy, or the larger food sector at the city scale, the report also includes information about national and regional policies and programmes that have an impact on local systems.

FIGURE 1: Location of Bangalore



Source: IIHS

FIGURE 2: Skyline of Bangalore

Source: <http://www.realtyfact.com/property-rates-in-bangalore/>

2. DEMOGRAPHY

2.1 Urbanization and Population Growth

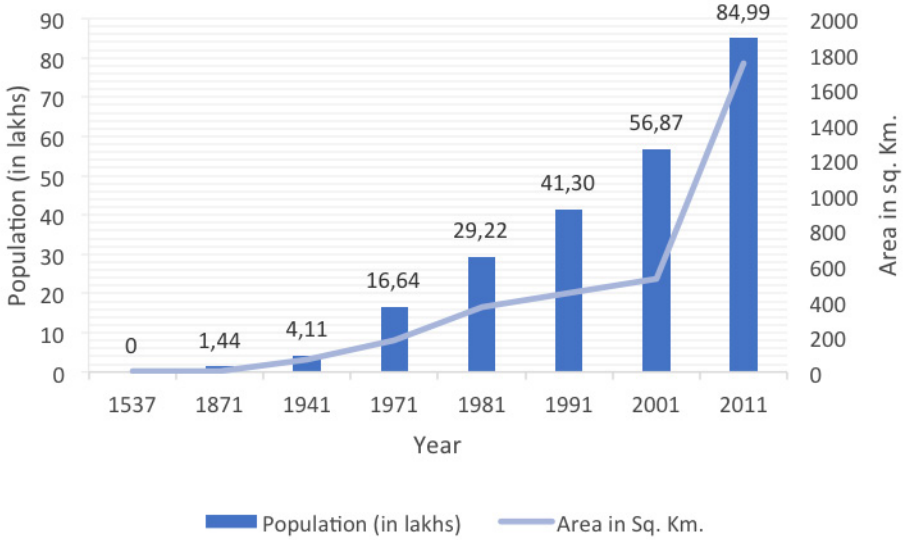
Bangalore's population grew from 1.6 million in 1971 to 4.1 million in 1991 to 8.5 million in 2011 (Figure 3). The area covered by the city increased from 200km² in 1971 to 1,900 km² in 2011. Over the past decade, Bangalore's population has grown by over 40%. The city has been growing three times faster than the population of the state of Karnataka as a whole. Karnataka was 18% urbanized in 1960, a figure that had increased to 31% in 2011 (Figure 4). Karnataka's urbanization pattern is distinctive, with most of its urban population concentrated in its only large metropolitan area, Bangalore. Bangalore is the only million-plus city in the state.

While there has been a rapid increase in Bangalore's population size, the contribution of the different drivers of population growth has remained relatively constant (Figure 5). Natural increase, in-migration and jurisdictional change accounted for a similar proportion of population growth between 1981 and 1991, and 1991 and 2001.

As its economy has grown, the physical footprint of Bangalore has also expanded, almost doubling over the past decade. This increase has come at the cost of Bangalore's vegetation cover and water resources, especially on the city's periphery. The benefits of this growth have not been uniformly distributed, although a lower proportion of Bangalore's population suffers from extreme poverty compared to other urban areas in India, and a higher proportion of households are in the

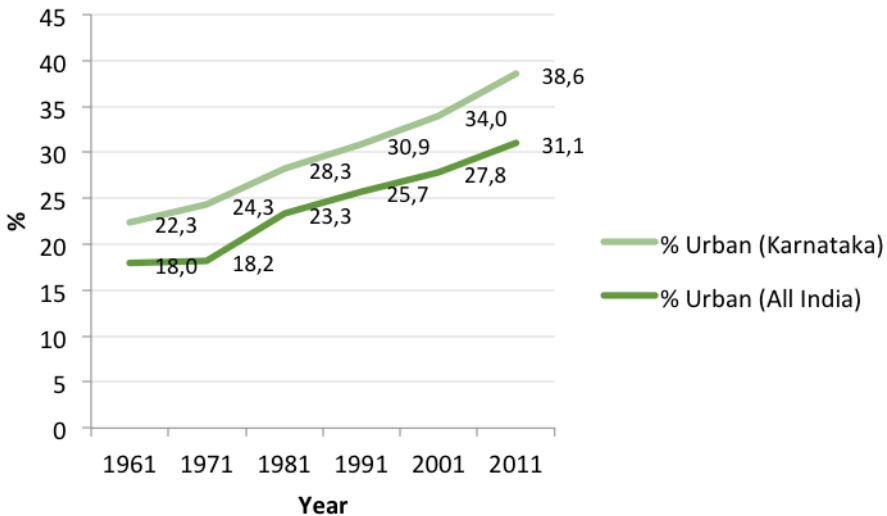
middle and upper-income groups. However, about 43% of the city’s population still lives in multi-dimensional poverty (IIHS et al 2013).

FIGURE 3: Growth of Bangalore, 1871-1911



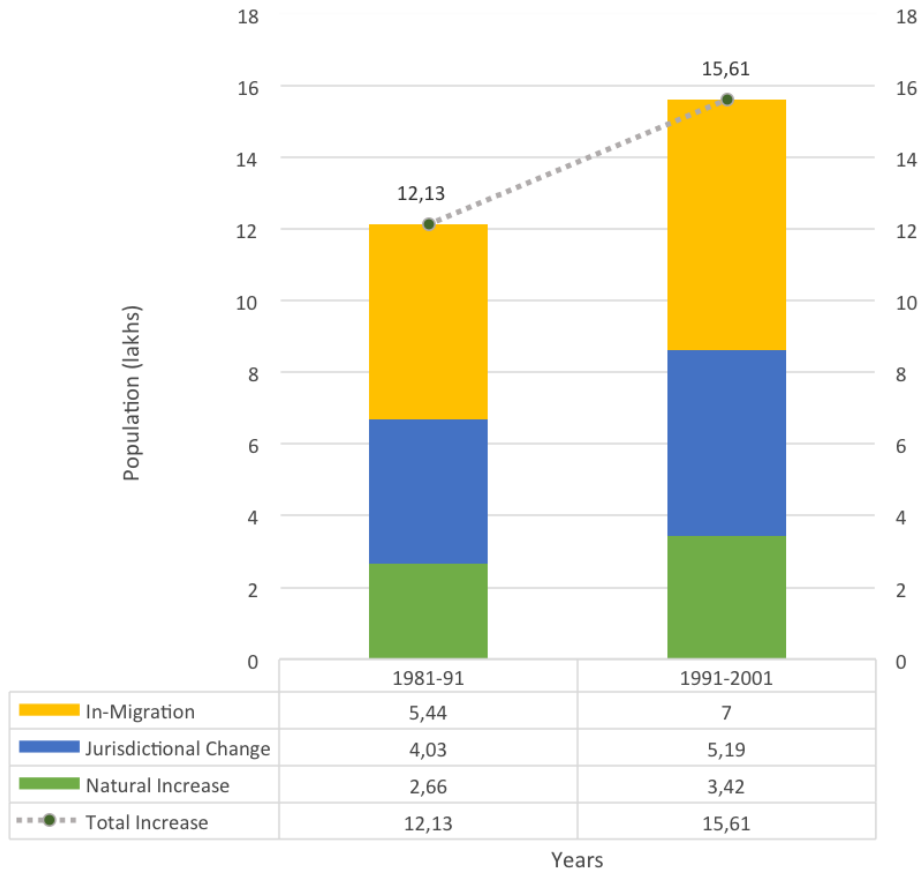
Source: Census of India (various years)
 Note: 1 lakh = 100,000

FIGURE 4: Urban Population in India and Karnataka



Source: Census of India (2011)

FIGURE 5: Composition of Population Growth in Bangalore, 1981-2001



Source: City Development Plan for Bangalore (Jawaharlal Nehru National Urban Renewal Mission 2006)

2.2 Migration to Bangalore

In-migration accounts for the majority of Bangalore’s population growth (Table 1). About half of the population growth between 1991 and 2001 was due to migration from other cities or from rural areas, and half of these migrants came from within the state of Karnataka. Migration is largely driven by work opportunities, with 41% of migrants to Bangalore citing work as the reason for migration, and another 40% moving with their family or because of marriage (Fulford, 2015). This is in keeping with national-level data on migration, which shows that work is the primary reason for male migration and marriage is the primary reason for female migration (IIHS et al 2013). The volume of in-migration is largely due to Bangalore’s status as the information technology (IT) hub of India. Bangalore has attracted the largest percentage of “highly educated migrants,” defined as graduates and post-graduates. Census 2001 notes that the Bangalore Urban Agglomeration (UA) received 350,000 in-migrants from other states in the previous decade – more than cities such as Chennai and Kolkata – and attributes

this to growing opportunities in IT-related work. The share of in-migrants in the total population of the Bangalore UA was the third highest among major UAs in the country in 2001.

TABLE 1: Number of In-Migrants to Bangalore in Previous Decade by Place of Last Residence

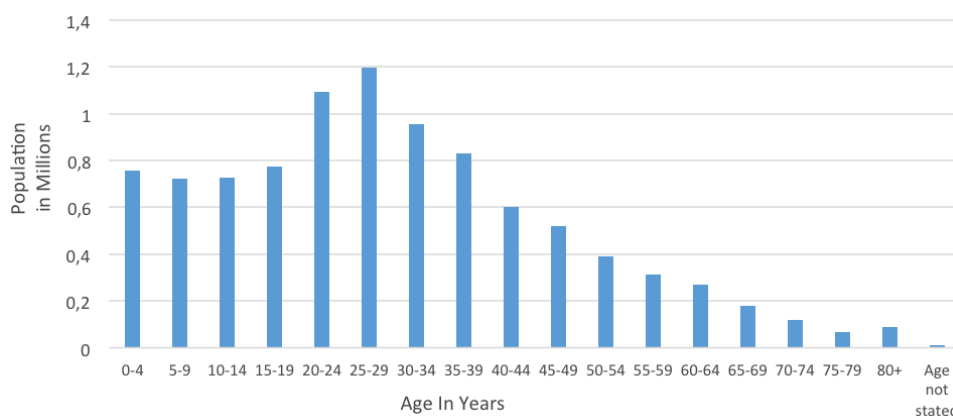
	2001 population	In-migrants			Total in-migrants	% of in-migrants
		From within state	From other states	From other countries		
Bangalore UA	5,701,446	401,932	353,156	6,397	761,485	13.4

Source: Census of India 2001

2.3 Age and Gender Distribution

With its temperate climate, Bangalore was once known as a “Pensioner’s Paradise” with many people moving there to retire. More recently, Bangalore’s age distribution has changed and more than half of the population is now under the age of 30, with another quarter in their 20s, which is similar to national demographic trends (Figure 6).

FIGURE 6: Age Distribution of Bangalore, 2011

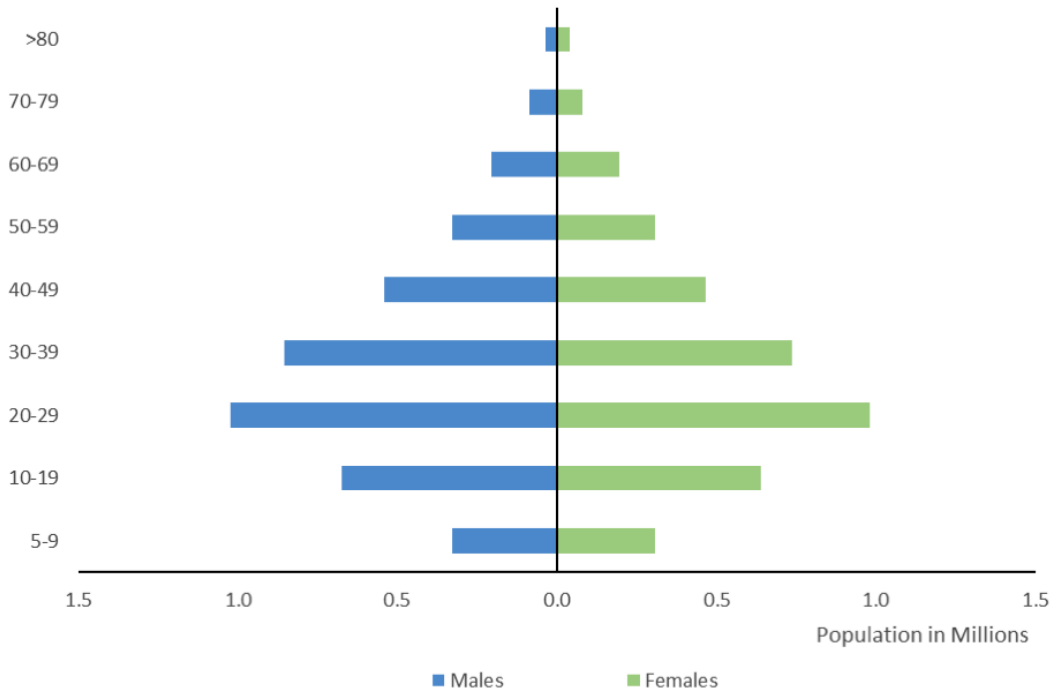


Source: Census of India (2011)

According to the most recent census, the male-to-female ratio of Bangalore is 916 to 1,000 ; a slight increase in the proportion of females from the previous census in 2001 which reported the ratio at 908 to 1,000 (Figure 6). Despite this change, Bangalore is below the national ratio of 940 to 1,000. The sex ratio in India is generally seen as an umbrella indicator of gender equity. The skewed sex ratio in the country is a small indicator of the kind of inequality that exists in nutritional access for women and young girls, compared to men and young boys.

IIHS analysis of urban areas in India has found that the sex ratio in million-plus cities is typically less equal than the national average (Jana and Malladi 2015). There could be several reasons for this, including greater in-migration of men for work to larger cities and a societal preference for male children.

FIGURE 7: Population Distribution of Bangalore by Age and Sex, 2011



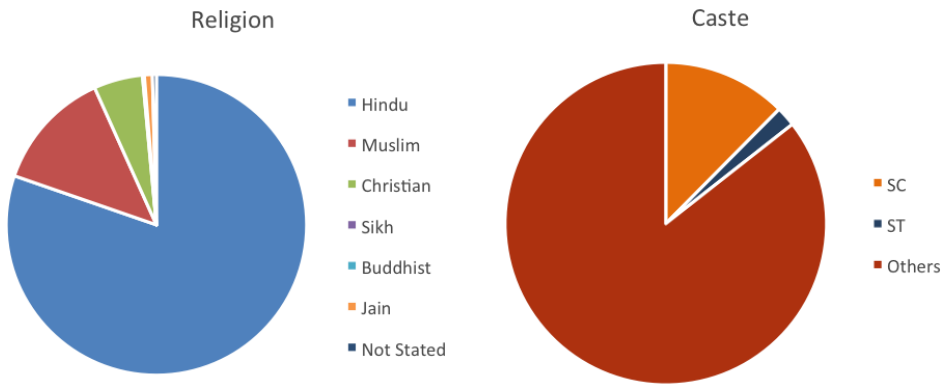
Source: Census of India (2011)

2.4 Distribution of Population by Religion

The major religion in Bangalore is Hinduism, which accounts for 80% of the population (Figure 8). Almost 13% of the population practises Islam, and 5% are Christians. The other 2% comprise Sikhs, Buddhists, and Jains (as well as those who did not state a religion). Religious dietary preferences and related socio-economic factors can affect food patterns, nutritional status and calorie gaps, and food-based social assistance programmes (Mahadevan and Suardi 2013). According to the Census of India (2011), Scheduled Castes (SC) and Scheduled Tribes (ST) make up 12% of the population of Bangalore. Caste plays a significant role in determining food and dietary habits, as well as the economic and social vulnerabilities of certain groups in both urban and rural areas of India. It is a historical and a current source of identity-based discrimination and a cause of disadvantage for groups. The Scheduled Caste and Scheduled Tribes are administrative groups created by the affirmative action mandate of the Indian state for

historically disadvantaged people in India. The Scheduled Castes and Scheduled Tribes comprise about 16.6% and 8.6%, respectively, of India’s population (Census of India 2011).

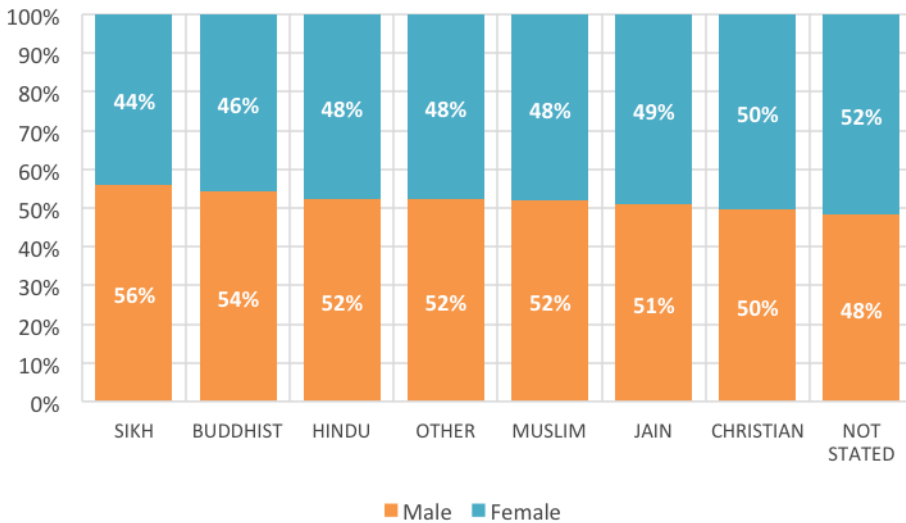
FIGURE 8: Religion and Caste Composition of Bangalore, 2011



Source: Census of India (2011)

Given the prevailing sex ratio, males account for the majority of adherents of each religion. The religion with the highest majority of males is Sikhism (56% male) (Figure 9). The religion with the largest proportion of females was Christianity at 50%.

FIGURE 9: Religion and Gender in Bangalore, 2011



Source: Census of India (2011)

2.5 Literacy and Education

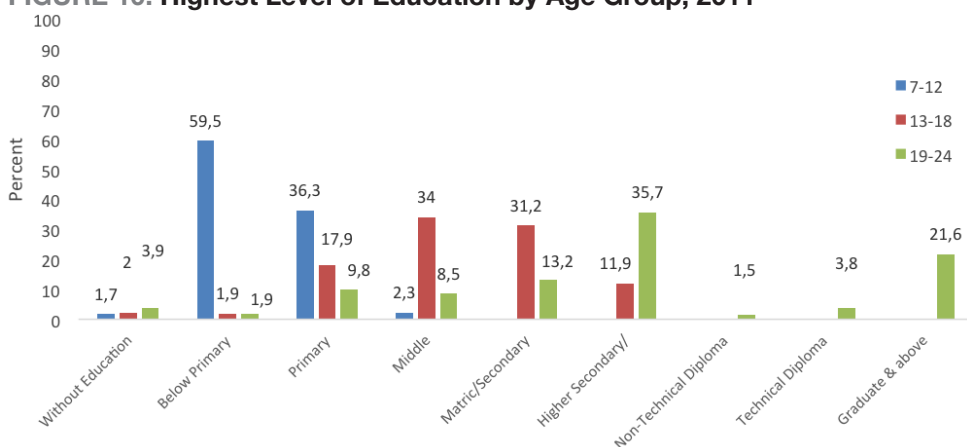
Bangalore has a literacy rate of 88%. The literacy rate for youth (aged between 15 and 24) is 95%, slightly above the national average of 90%. The adult literacy rate is 84% compared to the national average of 74%. Men in Bangalore have a 91% literacy rate and women 84%. Karnataka state as a whole has a literacy rate of 90% for men and only 78% for women. The gender inequality shown in the literacy gap is reflected in the workplace with women often having to undertake low-paying work or distress-driven entrepreneurship.

With only 38% of its primary schools being public, Bangalore presents greater cost barriers to access to education at the primary level. The Right to Education (RTE) Act in India guarantees free primary education to all children from the age of 5 to 12. This right has been difficult to implement in private institutions, with some taking legal action against it in urban areas including Bangalore.

Although the literacy rates for 13-18 year-olds and 19-24 year-olds are 96% and 94% respectively, the groups also have percentages of 2% and 4% of those literate with no education. The 5-12 year-old age group has less than 2% who are literate with no education, which could suggest that future generations will be more educated. The oldest age group has the highest percentage of literate people without education.

Karnataka has more expensive education on average (in both urban and rural areas) compared to the all-India rates for most levels of education. Given the state's concentration of engineering and technical institutions, as well as a strong and growing software and hardware engineering industry, the cost of education to enter these industries is higher than for the rest of the country. This has a significant impact on the ability of students to access job-readying education and implies a mismatch between the industries and the services in the state.

FIGURE 10: Highest Level of Education by Age Group, 2011



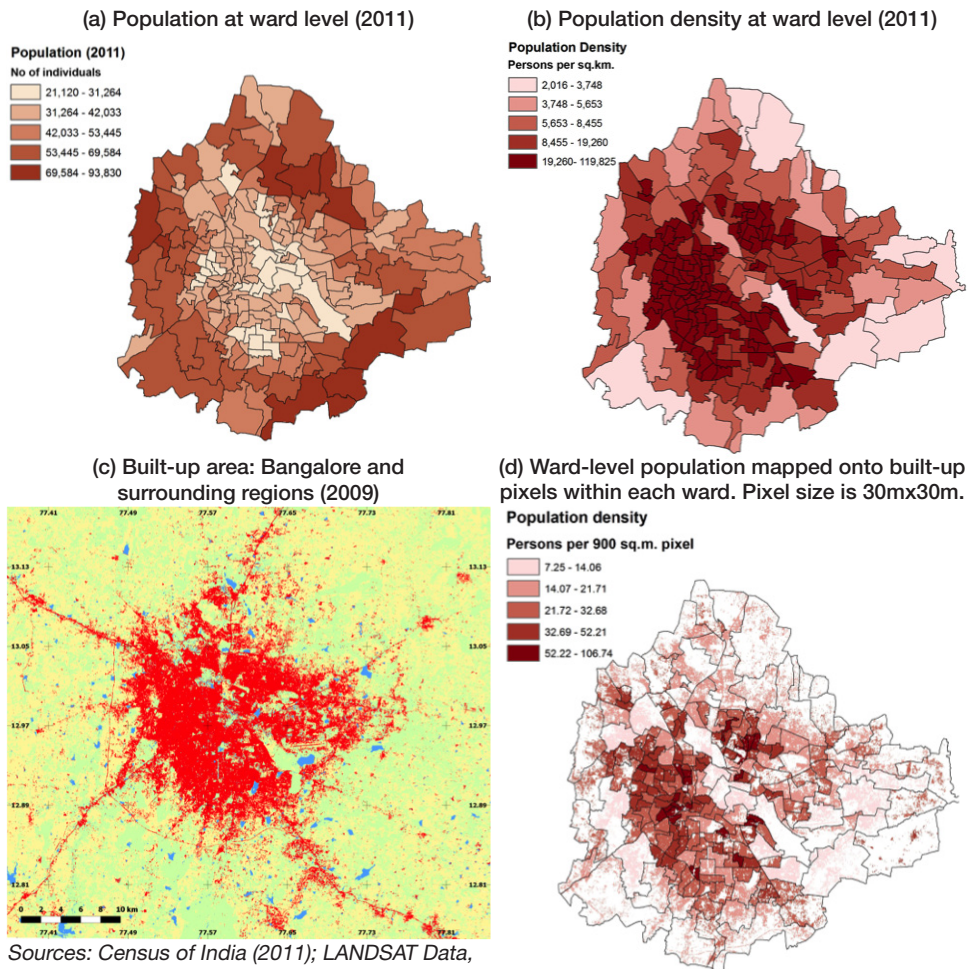
Source: Census of India (2011)

2.6 Population Distribution and Density

Bangalore is divided into 198 electoral wards. According to Bangalore's central municipal body, the Bruhat Bengaluru Mahanagara Palike (BBMP), the wards cover a total area of 709.49km². While the average ward is about 3.58km², the ward sizes vary greatly. Wards towards the centre of the city are smaller than those along the outskirts. The largest is Ward 198 at 30.5km², while the smallest is Ward 135 at 0.3km².

Bangalore has several wards near the city centre with relatively low population density (Figure 11). Together, the relatively low-density central wards and surrounding higher-density wards comprise the extent of Bangalore Mahanagara Palike before the formation of the BBMP in 2007. The peripheral wards, which were added in 2007, also exhibit relatively lower densities in comparison to the ring of high-density wards surrounding the central region of Bangalore city (IIHS et al 2013).

FIGURE 11: Population Density and Built Up Area of Bangalore

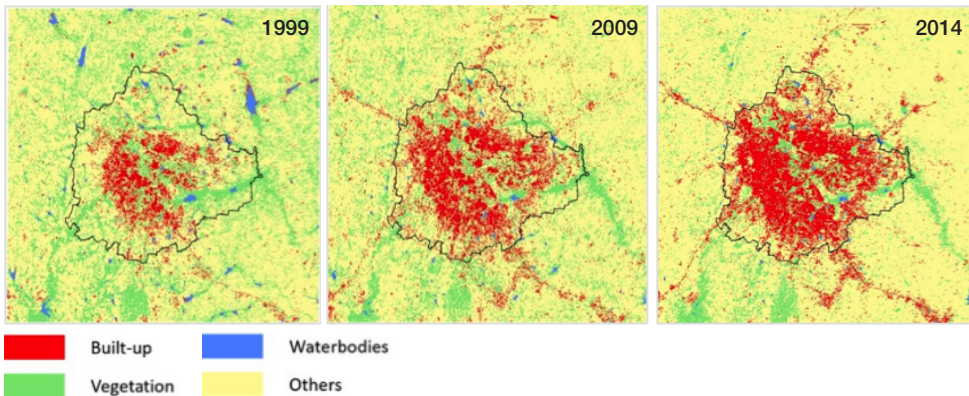


3. HOUSING AND LAND USE

3.1 Spatial Patterns of Land Use

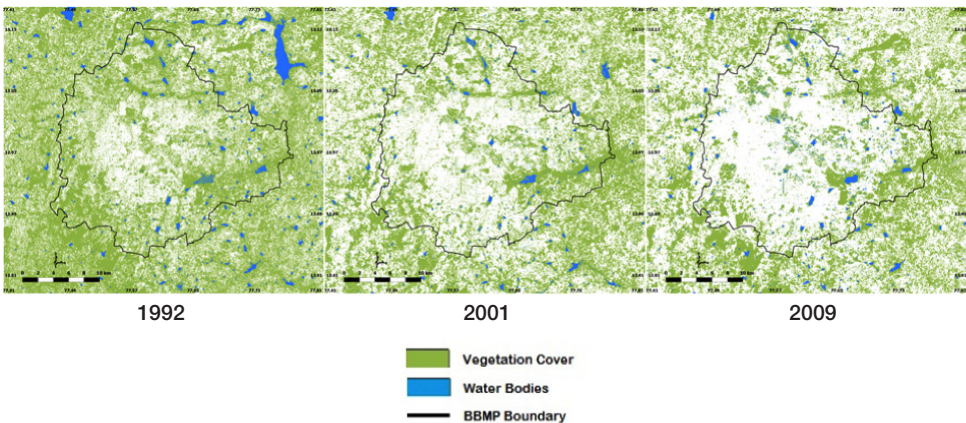
With no natural features restricting its development, spatial growth patterns of Bangalore city are characterized by urban sprawl. Over the past four decades there has been over 500% growth in built-up areas, with a decline in both vegetation and water bodies by over 60%. From 1992 to 2009, Bangalore’s built-up area increased by 134%, leading to a sharp decline in water bodies and natural vegetation (Census of India 2011, IIHS 2009, Ramachandra and Kumar 2009). Figure 12 demonstrates the massive amount of construction in Bangalore in the past two decades. The built-up area is shown in red, with vegetation noted in green and bodies of water in blue. Areas of vegetation and bodies of water are being taken over by this rapid development. As Figure 13 shows, there has been a significant decline in water bodies and green cover.

FIGURE 12: Expansion of Bangalore’s Built-Up Area, 1999-2014



Source: IIHS

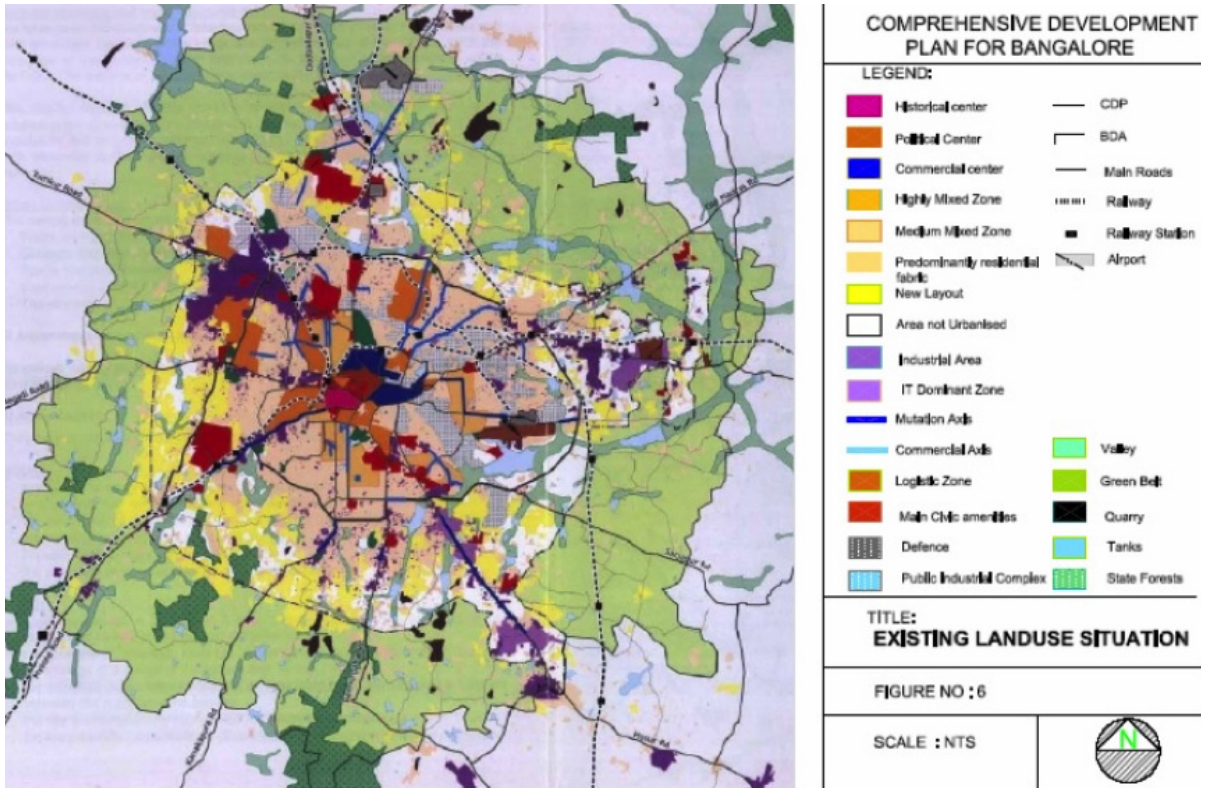
FIGURE 13: Change in Vegetation Cover, 1992-2009



Source: IIHS

Figure 14 shows the city's overall land use pattern in 2007, according to the Bangalore Master Plan. Light purple indicates the IT-dominated zones, while the main civic amenities are noted in red. Industrial areas are noted in dark purple, and the light green areas indicate a green belt. The green belt exists mostly on the outskirts of the city while the centre has more mixed-use zones, or areas with a combination of the listed zones.

FIGURE 14: Bangalore Land Use Map, 2007



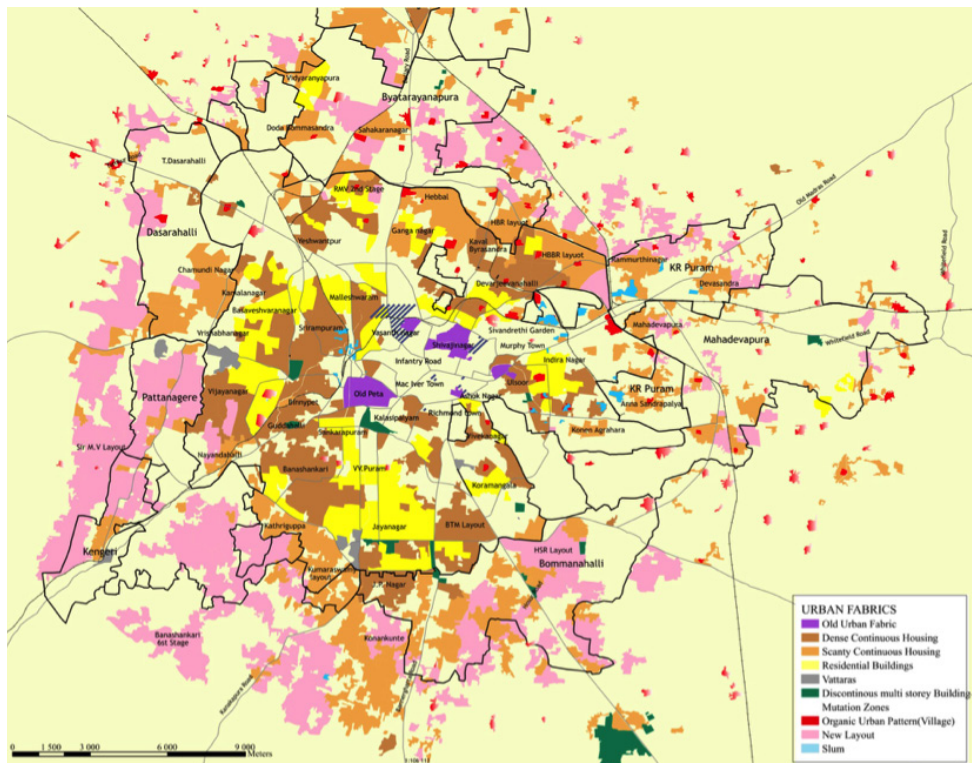
Sources Government of Karnataka, Bangalore Master Plan 2007

In response to the city's rapid growth, the Revised Master Plan for Bangalore (2015) (Government of Karnataka 2015) propagated a "compact city model" that promoted consolidation and intensification of the urban core, while establishing secondary employment and mixed-use centres aligned with public transit nodes. In practice, formerly purely residential areas have become mixed-use residential areas and peripheral areas have witnessed a spurt of high-rise developments. With spiralling land and property prices in other mega-cities such as Delhi and Mumbai, private developers from these cities have invested in property development in the peri-urban areas of Bangalore, further expanding the real estate market base. The densification of the core is a complex issue, particularly because it involves significant changes in the land market, as well as integrated mass transit development and massive investment in infrastructure upgrading (IIHS et al 2013).

3.2 Housing Types

Figure 15 shows the different types of housing in Bangalore. The oldest areas of the city (like Chickpete – the old market area) have a dense urban fabric, and exhibit mixed use, while several of the newer areas are characterized by multi-storey buildings and residential complexes (Figure 16). Many urban residents in Bangalore live in self-constructed settlements that are often called “informal” or “illegal” settlements and have diverse forms. Their most recognizable form is the “slum” – settlements without basic infrastructure or amenities and with physically inadequate dwelling units (Figure 17). Many slums also have uncertain security of tenure. Gopal and Nagendra (2014: 2461) describe the typical slum as “densely packed housing units including shacks, huts, tents, pukka (made of durable materials such as concrete) houses and kacha (made of natural materials such as mud and thatch) houses with narrow lanes, irregularly interspersed with trees, and with potted plants placed in and around the restricted space associated with most households.” Other kinds of informal settlement include more elite developments – often called “unauthorized colonies” – also built in violation of Master Plans, usually through the illegal conversion of rural land or violation of zoning laws. This has a bearing on the quality of urban service delivery (water and sanitation services) and extends to the nutritional content of food available to citizens of the city, their forms of work and ability to earn (Bhan et al 2016).

FIGURE 15: Distribution of Different Housing Types in Bangalore



Source: BDA (2015)

FIGURE 16: Multi-Storey Residential Complexes in Bangalore

Source: <https://www.realtycompass.com/blog/tag/real-estate-bangalore/page/3>

FIGURE 17: Bangalore Slum Dwellings

Source: Duke Chronicle (2014)

4. FORMAL AND INFORMAL ECONOMY OF BANGALORE

4.1 Formal Industry in Bangalore

The industrialization of Bangalore began with the British, who set up a number of corporations to help their Second World War efforts and created a state-owned radio and electric manufacturing company (Dittrich 2007). These investments were mainly in the industrial and defence sectors, although the public sector also received funds. Bangalore also has a long history of manufacturing, especially textiles, although recent emphasis has been on the emerging service sector economies in the city (Sudhira et al 2007). Before IT became the main focus of the city, aerospace and aeronautic technology was at the centre. Because of the city's involvement with these industries, science, engineering and technology schools were established and led to a population skilled in these areas. One such institution is the Indian Institute of Science, which was established in 1909 and today has programmes including nano-science and engineering, as well as brain research (IISC 2014).

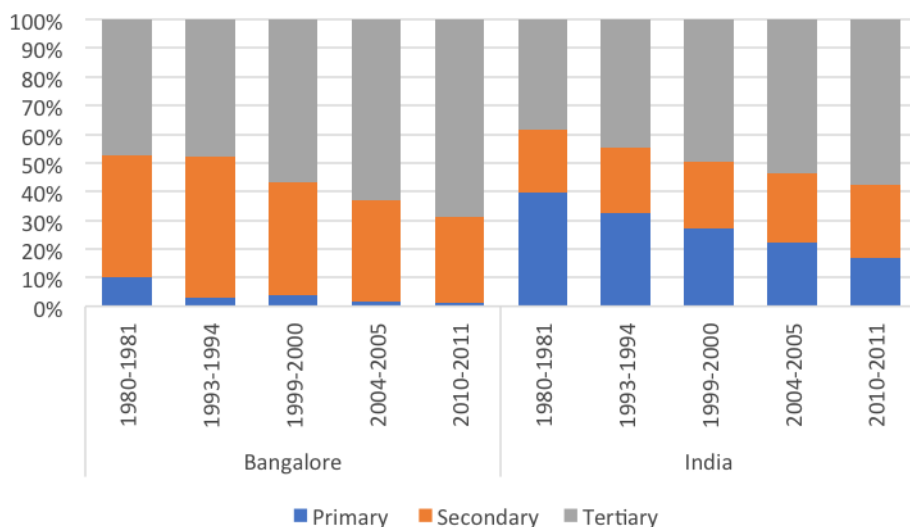
Bangalore is the hub of India's IT sector and accounts for nearly 40% of the country's IT industry. In 2000–2001, Karnataka exported software worth over USD1-billion, over 90% of which is estimated to be from Bangalore. More recent estimates are that Bangalore is responsible for 98% of software exports in the state (Basant 2008). The growth of Bangalore as an IT hub began in 1972 with the launch of the Software Export Scheme, which gave concessions to software exports and low tariffs to hardware imports (Basant 2008). The opening up of foreign investment in these industries buoyed the development of the IT sector, as did the creation of special economic zones and clusters for IT and IT-related services. In the past few decades, government policy has enabled Bangalore's economy to boom and yielded educational infrastructure that has produced highly skilled workers for this sector.

The national economic reforms of the 1990s brought further changes to Bangalore's economy: while the 1950s to the 1980s had been characterized by public sector investment, the 1990s saw the growth of the private sector, particularly IT and related industries (Heitzman 2004, Nair 2005). A variety of domestic and international corporations such as Wipro, Infosys, Microsoft and IBM were attracted to the city partly by its numerous academic institutions and skilled workforce. Companies including Texas Instruments, Infosys and Microsoft have built large campuses on the edge of the city. The state government of Karnataka has several investment incentive programmes and policies in place, such as land and tax incentives, in addition to building infrastructure including elevated

roads, a new metro and airport, and setting up special economic zones. This growth of new economic sectors in Bangalore also led to a boost in the local and regional real estate industry (Benjamin 2008, Nair 2005).

Over time, therefore, there have been notable changes to the structure of the city's economy (Figure 18). Between 1980 and 2005, there was a dramatic decline in the proportional GDP contribution of primary and secondary industry and a concomitant growth in tertiary industry. The changes in Bangalore have been more intense and radical than in the country at large. Although there has been a major decrease in the prominence of agriculture in India (from almost 40% in 1980 to less than 23% of GDP in 2004), this decrease was much more pronounced in Bangalore. The share of primary sector activities in Bangalore decreased by 69% between 1980 and 1993, reflecting the move away from agriculture and the new emphasis on the secondary and tertiary sectors. The tertiary sector supplied about 48% of Bangalore's GDP in 1980-1981, and almost 70% in 2010-2011.

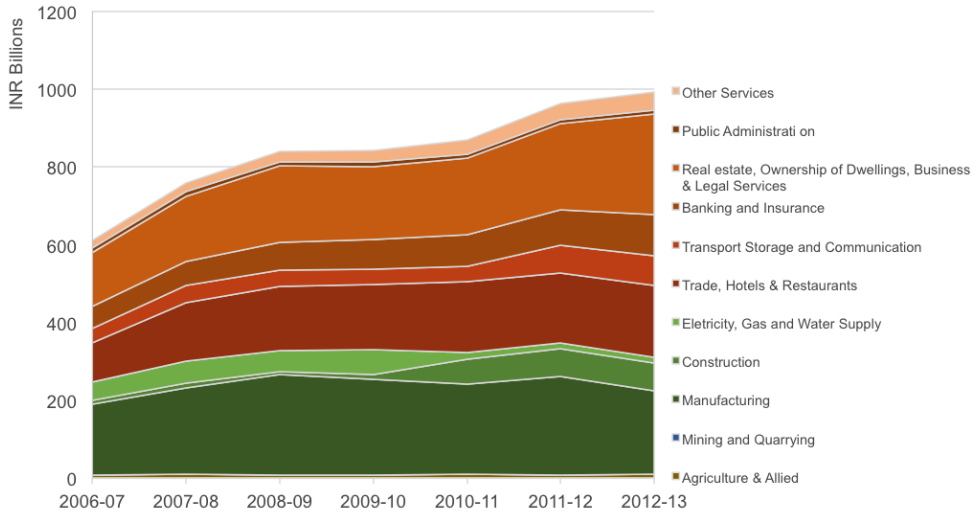
FIGURE 18: Sectoral Contribution to GDP in India and Bangalore



Sources: Carol Louie Analysis 2011, Central Statistical Organization (India), Narayana 2008 (Bangalore)

Figure 19 shows the industries that were large contributors to Bangalore's GDP in 2004-2005. This figure does not include the IT sector but focuses on other large contributors to the economy. It shows that manufacturing, real estate, business and legal services were significant contributors. Trade, hotels and restaurants were also major contributors. According to a recent report on Bangalore by the USDA Foreign Agricultural Service, USD4.1-billion was spent on food and non-alcoholic beverages in Bangalore in 2013 and another USD468-million was spent on hotels and catering (Jashnani 2015).

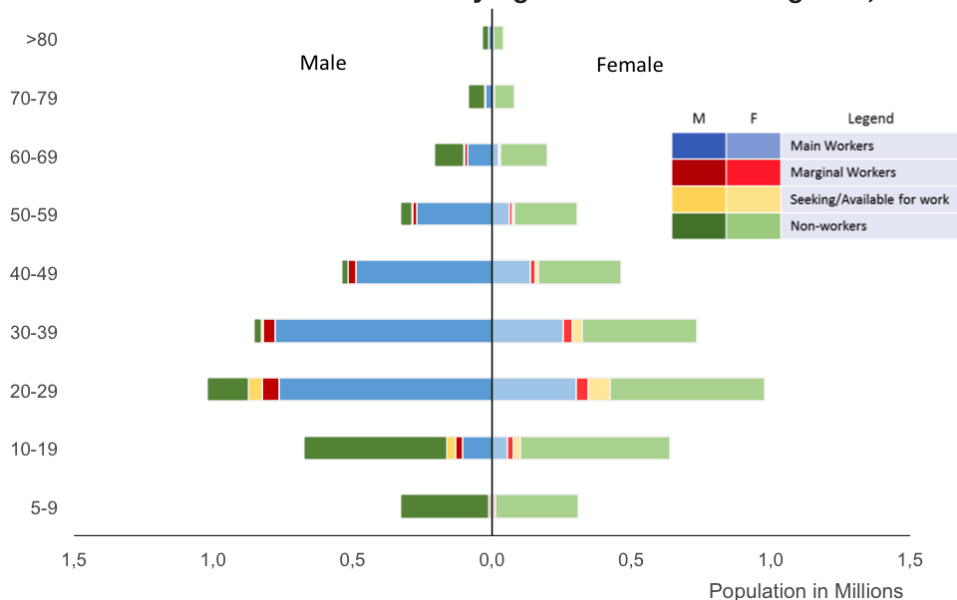
FIGURE 19: Non-IT Contributors to Bangalore GDP, 2004-2005



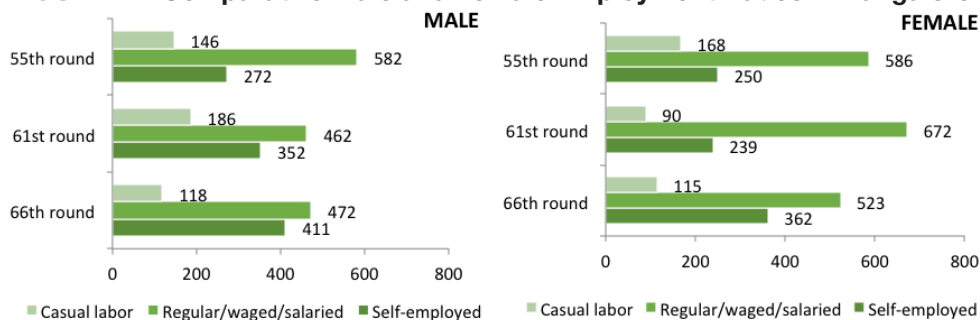
Sources: Directorate of Economics and Statistics (2011), IHS Analysis

4.2 Formal Employment and Unemployment

The categorization of workers in the Census of India (2011) is based on the duration of work – that is, main workers have continuous work for more than six months in a year and marginal workers are those who have work for less than six months in a year. In Karnataka as a whole, there was increase in main workers among both genders between 2001 and 2011. This increase was more evident in rural areas and for rural females where the number of main workers increased by 8%. In urban Karnataka, the story is different, with growing casualization of labor. According to India’s National Sample Survey Organization (NSSO), residents of urban Karnataka are engaged in regular salaried jobs or are self-employed in almost equal measure (NSSO, 2012). According to the 2011 census, 44% of the population was listed as either a main worker or marginal worker, with only about 4% of the population (approximately 375,000 people) listed as seeking work/available to work. Of those seeking work, the majority are women. Figure 20 categorizes the workforce by type of employment (main or marginal), age and gender. Female labour force participation in India is low even for countries with similar development patterns. Bangalore’s workforce distribution mirrors this. The measure of women who are non-workers is high. Even among the women who do work, there is a slight drop in their participation from the younger cohort aged between 20 and 29 years old and the older groups. However, the census data does not capture the majority of women’s workforce participation, which is as unpaid workers in family micro-enterprises, or running an own-account enterprise that is not counted in formal statistical measures.

FIGURE 20: Distribution of Workers by Age and Gender in Bangalore, 2011

The National Sample Survey of India (NSS) collects different sets of data through five-year nationally representative employment surveys (MOSPI 2017). Figure 21 shows the distribution of male and female workers by employment profile at three different points in time. The NSS data in Figure 21 comes from the years 1999–2000 (55th round), 2004–2005 (61st round), 2009–2010 (66th round). Regular/salaried employment is significantly higher than casual employment for both men and women, although it appears to have been falling for both. Self-employment has also increased considerably for both. According to the National Commission on Enterprises in the Unorganized Sector, for men the trends are clear: a persistence of casual work, a reduction of regular/salaried work and an increase in self-employment. For women in Bangalore, the data indicates that there was first an increase in formal employment and then a larger decrease in those numbers, although formal employment rates are still higher for women than men. A similar trend can be seen for casual women workers with an increase in these numbers.

FIGURE 21: Comparative Male and Female Employment Ratios in Bangalore

4.3 Informal Economy

In addition to a large formal economy, Bangalore has a growing informal economy. The figures for self-employment in Figure 21 largely consist of what is known as own-account work, which largely occurs in the informal economy. The types of work vary widely, but a significant proportion is undoubtedly precarious and marked by risk (Roever 2014). Between 1971 and 2001, the share of workers in the manufacturing sector declined from 36% of the workforce to 29%, with services showing a commensurate increase. The textiles sector is included within manufacturing, and tends to be structured around small-scale, informal enterprises, which are characterized by marginal and self-employment and largely dominated by female workers (IIHS et al 2013).

The informal economy plays a significant role in the life of Bangalore. Street vendors sell an array of items from flower garlands to prepared foods to children's toys. Vendors utilize various methods for selling, such as walking around with a cart or sitting on the road selling items from a basket. Although each vendor is different, they all face the same problem of finding places to sell their goods when there are no designated zones for this. Although the BMP announced hawking zones and licences in 1999, research suggests that neither vendors nor officials were aware of where the zones were or even of their existence (Naveen and Hampole 2004). The authors said that vendors were sometimes harassed by officials and forced to pay bribes. In 2007, the BMP was replaced by the BBMP and new plans were announced for hawking licences as well as hawking zones. However, nothing official has yet been released and vendors continue to sell wherever they can.

As Roever (2014) explains, the precariousness of operating in the informal economy is reflected in financial costs like paying cash for accessing city streets or sidewalks, bribing municipal authorities to ward off evictions, paying for basic services like water, electricity, storage, public toilets and waste removal, whether or not these services are actually delivered. There are several disadvantageous ways in which informal economic actors are incorporated into the economic and social life of cities that bear on their ability to have decent work and income. Street vending is emblematic of the issues of the informal sector, especially when related to food items both cooked and uncooked.

According to the Government of India (2004), there are 10 million street vendors in India and Williams and Gurtoo estimate that 30,000 of those vendors are in Bangalore. The city centre has permanent vendors located near the main markets, while on the outskirts of the city, vending is mobile with vendors carrying goods in baskets on their heads or on carts. One recent study of street vendors in Bangalore found that they did not consider their activities as temporary or a stop gap. Most had not had a formal job in their working life. About half had been

operating in the same vending space for over five years. The range of earnings for these vendors was INR32-100 of which 30% went in payments to avert municipal harassment (Williams and Gurtoo 2012)

5. POVERTY AND DEPRIVATION

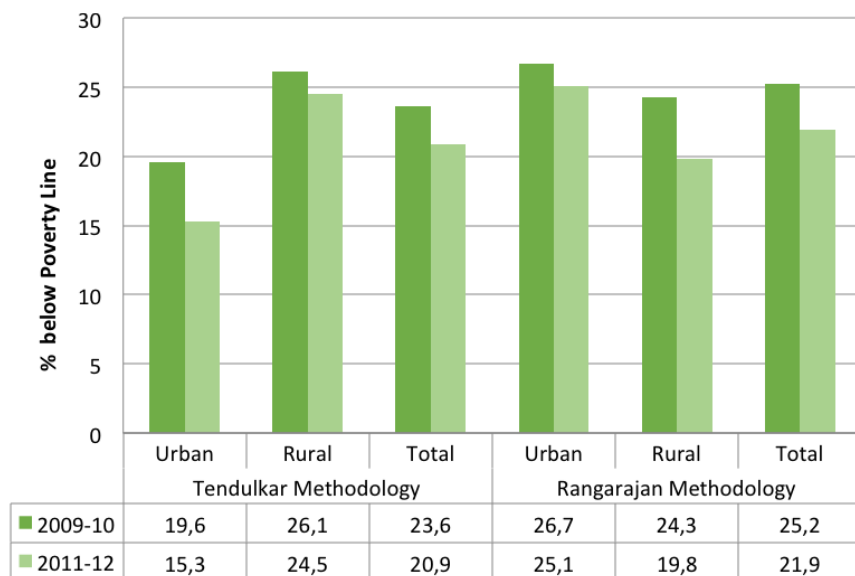
5.1 Income Poverty

Until recently, India's development agenda has been directed at redressing rural poverty as urban locations were seen as implying access to better food, education, work and wages. This notion is now being revised and urban areas are featuring in debates on poverty classification. The urban poor pay a "poverty premium" for basic services including food and non-food expenses; spending more on average as a percentage of their income than their rural counterparts (Lee 2011, Mitlin and Satterthwaite 2013). The 2009 Tendulkar Committee of the Planning Commission of India estimated per capita poverty in India at INR816 and INR1,000 in the rural and urban areas respectively (Figure 22). The poverty line for the urban districts in Karnataka was higher than the all-India average at INR1,089. In 2011-2012, the urban poverty rate was calculated at 15.3% or 3.7 million people. However, poverty lines represent minimum levels of expenditure and many have argued that they actually measure destitution, and that widespread poverty exists above the formal poverty line. In 2014, a revised methodology to estimate poverty was proposed by the Rangarajan Committee of the Planning Commission of India. The committee raised the per capita urban poverty line in Karnataka to INR1,373 and the 2011-2012 urban poverty rate to 21.9%.

Of the four southern Indian states, Karnataka has the highest incidence of urban poverty. Using the Rangarajan method of poverty estimation, Figure 23 shows that Kerala had the lowest proportion of urban poor (15.3%), followed by (then undivided) Andhra Pradesh (15.6%), Tamil Nadu (20.3%) and Karnataka (25.1%).

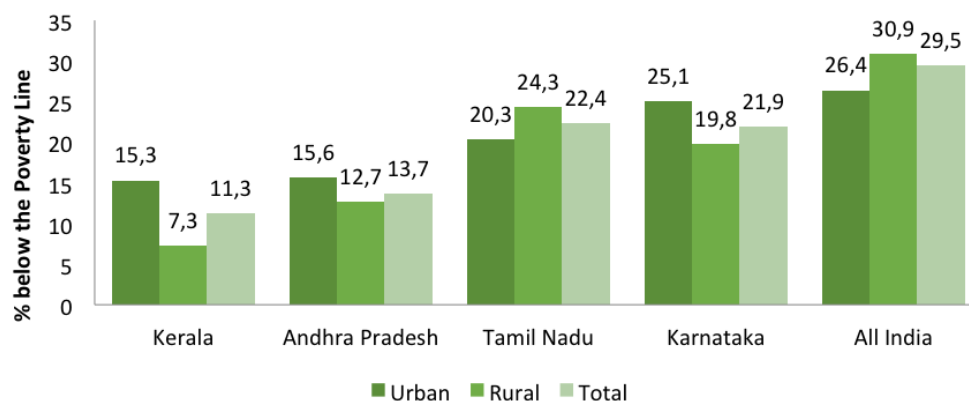
Figure 24 shows the distribution of household income across monthly per capita expenditure deciles in Karnataka. Nearly 90% of urban households earn less than INR200,000 per year (about USD3,000) and are classified as Low Income Group families by the Ministry of Housing and Urban Poverty Alleviation. Relative to urban India and urban Karnataka, Bangalore's income distribution represents a lower proportion of extreme poverty, and a higher proportion of households in the middle and upper-income groups (Figure 25).

FIGURE 22: Poverty Ratios in Karnataka: Tendulkar and Rangarajan Committee Estimates



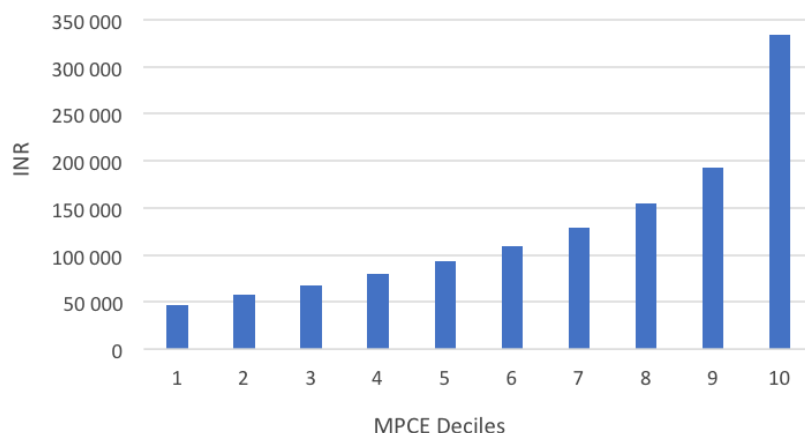
Source: Planning Commission of India

FIGURE 23: Proportion of Population Below Poverty Line in Southern States, 2011-2012



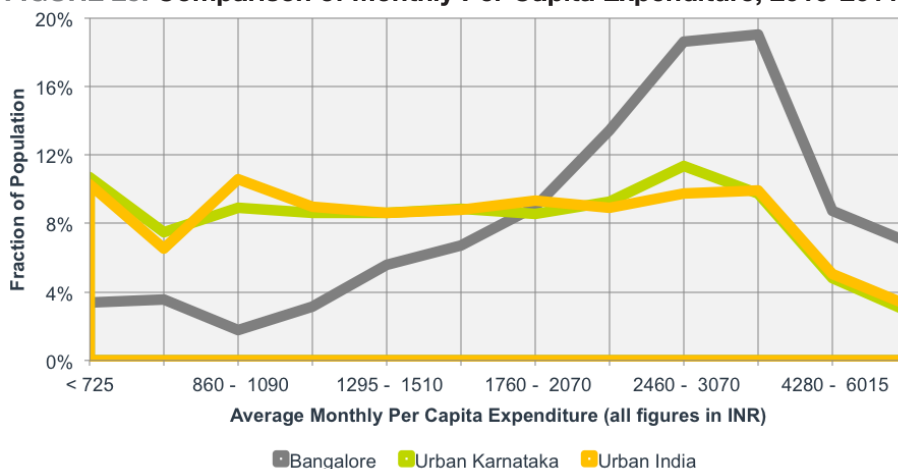
Source: Planning Commission of India

FIGURE 24: Average Annual Urban Household Consumption Expenditure in Karnataka, 2009-2010



Source: National Sample Survey Office of India

FIGURE 25: Comparison of Monthly Per Capita Expenditure, 2010-2011



Source: National Sample Survey Organization, 66th Round and IIHS Analysis

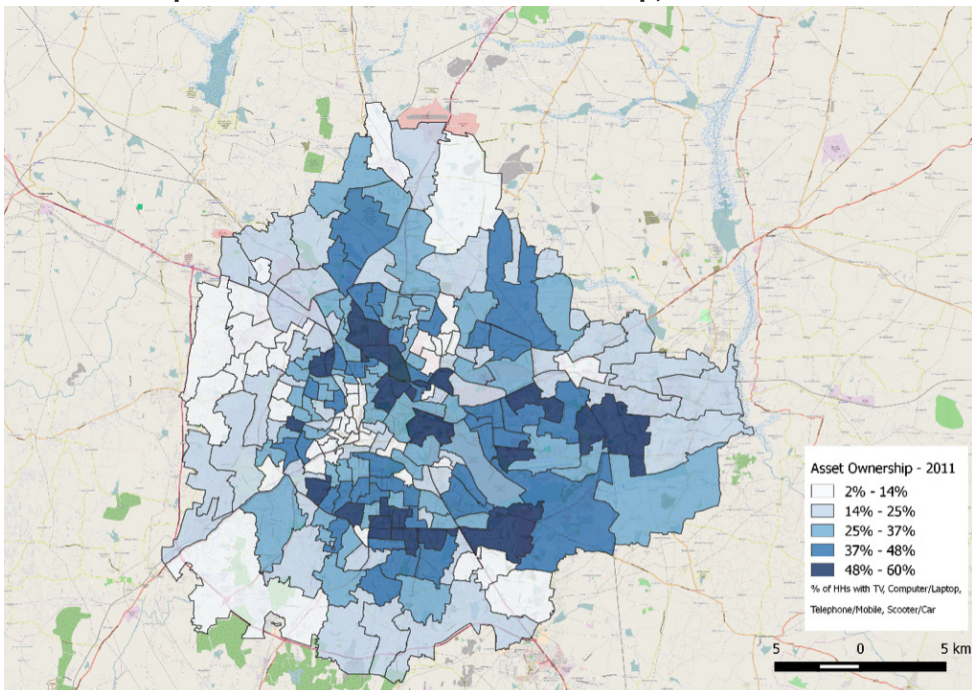
5.2 Asset Ownership and Deprivation

For this report, we created an asset index and a deprivation index as proxy indicators of poverty in Bangalore. The asset index includes assets such as televisions, computers or laptops, telephones or mobiles, as well as a scooter or a car. A high asset index score indicates greater asset ownership. For the deprivation index, the indicators chosen were equally weighted and a higher index indicates more deprivation. The indicators were: (a) roof made of grass/thatch/bamboo/wood/mud/plastic/polythene etc.; (b) no exclusive room; (c) water source away from premises; (d) no latrine; (e) no drainage facility; (f) fuel for cooking – firewood, crop residue, cow dung, charcoal, biogas; (g) no assets owned; (h) % of Sched-

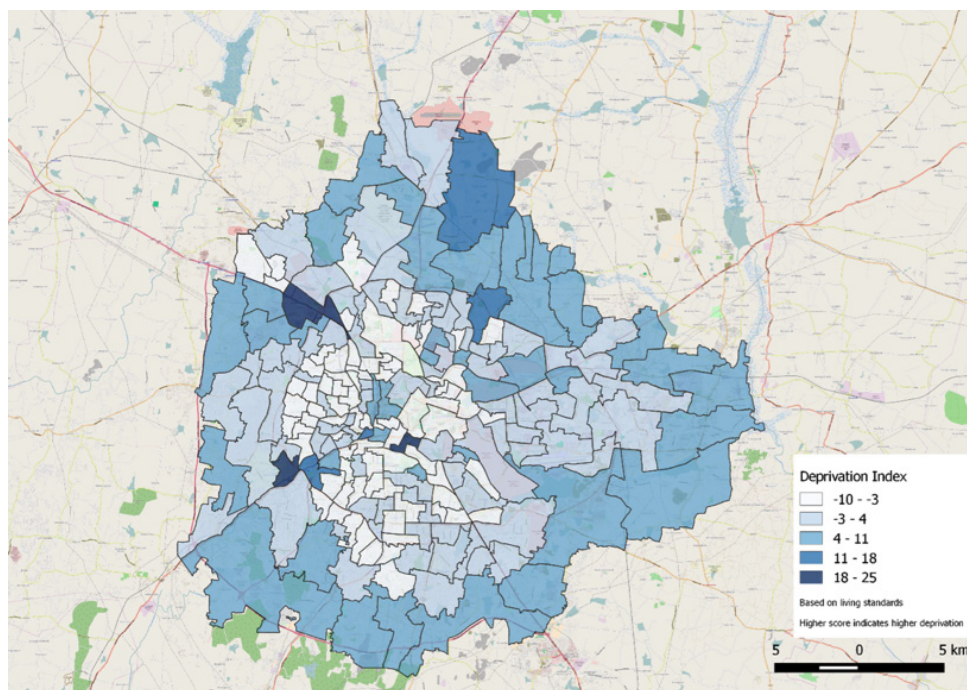
uled Caste population; and (i) % of marginal workers (defined as those who have been working for six months or less). The data was drawn from the 2011 census.

Figures 26 and 27 show the spatial distribution of the analysis based on the two indices. In general, there is a higher ownership of assets in the core areas of Bangalore and in certain peripheral areas that are a part of the city's IT corridor. The deprivation index is higher in areas on the periphery of the city, largely due to poor access to water and sanitation services even in wards with high asset ownership. A good example of this is Ward 150 (Bellanduru), which has a high asset index value and a high deprivation index due to its poor water and sanitation provision. The three wards with the highest asset index are Wards 85 (Doddenekundi), 165 (Ganesh Mandir), and 179 (Shakambari Nagar). These wards have a greater concentration of private schools, commercial areas and a variety of commercial food establishments. Ward 85, for example, contains an area that was a settlement for Eurasians during the 19th century and remains a desirable neighbourhood with expensive real estate and commercial roads. It also includes the neighbourhood of AECS (Aeronautical Employees Co-operative Society), where many engineers live because of its proximity to software and IT offices. Those with the highest Deprivation Index were Wards 118 (Sudhama Nagar), 131 (Nayandahalli), and 38 (HMT). In general, wards with the highest asset index did not have the lowest deprivation index and vice versa. This indicates that even within these wards there is a large gap in income.

FIGURE 26: Spatial Distribution of Asset Ownership, 2011



Source: Census of India (2011), IIHS Analysis

FIGURE 27: Spatial Distribution of Deprivation, 2011

Source: Census of India (2011), IIHS Analysis

5.3 Health Outcomes

Bangalore echoes India's trends in health, that is, its urban residents do better than their rural counterparts on several indicators but bear the weight of life-style diseases that are closely linked to the kind of nutrition available to them. Type-2 diabetes has increased, with India often labelled the “diabetes capital” of the world. Diabetes is an important risk factor for cardiovascular disease, which is the major cause of death and disability in persons with diabetes. Rates are at 13.5% for urban men, nearly twice that of rural men; and 10.4% for urban women, nearly two-and-a-half times that of rural women. With its focus still on providing acute rather than chronic care, India's public health system is not yet adequately addressing this rising burden of non-communicable disease, which incurs greater treatment costs.

Bangalore has higher morbidity rates than rural areas in non-infectious, acute, and chronic diseases such as diabetes, cardiovascular and respiratory diseases (Table 2). While urban residents are likely to live longer than their rural counterparts, they are also more likely to face a greater burden of illness throughout their lives (Bhan et al 2016).

TABLE 2: Incidence of Chronic Illness and Lifestyle Disease in Karnataka, 2012-2013

Acute Illness*	Chronic Illness*	Cardiovascular Diseases*	Respiratory Diseases*
<ul style="list-style-type: none"> •Urban: 5.0% •Rural: 5.7% 	<ul style="list-style-type: none"> •Urban: 6.8% •Rural: 5.3% 	<ul style="list-style-type: none"> •Urban: 14.5% •Rural: 10.3% 	<ul style="list-style-type: none"> •Urban: 16.1% •Rural: 12.3%

Source: District Household Level Survey, 2012-13

6. URBAN FOOD SYSTEM

6.1 Food Sources

In terms of food production and agriculture, the state of Karnataka has a long horticultural history, which began in the mid-18th century with the foundation of Lalbagh, one of the most diverse botanical gardens in South Asia. The garden was commissioned by the ruler of Mysore, Hyder Ali, in 1760, and continued to be nurtured by the British after they took control. At independence, Lalbagh became a government botanical garden, and remains the headquarters of the Horticultural Producers Co-operative Marketing and Processing Society (HOPCOMS), which has a network of stores around the city. Bangalore's supply of fresh fruit and vegetables traditionally came from fields and villages in the hinterland of the city (Araki 2005). However, long-distance transportation has become just as common. As a result, the city now has a year-round supply of the most popular fresh food products. Arakai (2005) mapped the major geographical source regions for products in the Karasi-palayam market and shows that, while rural Karnataka is still the dominant supply area, some products were coming to the city from other states including Gujarat, Tamil Nadu, Kerala and Andhra Pradesh (Table 3).

Vegetable supply to the city is managed through multiple channels including HOPCOMS, the Agricultural Products Marketing Committee (APMC) and farmers' networks. HOPCOMS was originally a cooperative founded in 1959 and currently covers Bangalore and other urban centres. Each day over 70 tonnes of vegetables and fruit reach the city through HOPCOMS. The organization has its own small shops where it sells produce at fixed prices (Patil 2014). Farmers sell their produce to HOPCOMS and are paid in cash or by cheque on the same day.

The APMCs were established by state governments to regulate intermediaries in the supply chain (Patil 2014). Farmers now sell their products to commission agents under the supervision of the APMC. The Regulated Market Committee (RMC) yard in Kalasipalyam, which falls under the APMC, receives over 280 tonnes of vegetables per day from primary markets in Mandya, Mysore, Ramnagar, Doddaballapur, Chickballapur, Magadi, Hoskote, Sidlaghatta, Aneka, Malur and Kanakpura. An amendment to the APMC Act in 2013 meant that no market fees are levied on flowers, fruit and vegetables, and the marketing committee collects user fees from buyers at rates specified in the bylaws and approved by the Director of Agriculture Marketing. Buyers of fruit and vegetables pay a 1% commission fee to RMC yards, while farmers are not charged anything. This includes bulk buyers such as Safal and Reliance. The APMC Marketing Association President described the system as follows:

Every day farmers come and sell their produce to commission agents, middlemen who buy vegetables from producers. The price is decided on the same day depending on the quality and quantity of the produce. But here the farmers do not pay commission or money to the commission agents. Instead 5% commission from wholesalers and retailers goes to commission agents, out of which 1% is given to RMC (Patil 2014).

An amendment to the APMC Act delisted fruit and vegetables (perishable commodities) from the Act and now any farmer can sell vegetables to anyone. In response, recent developments include farm-to-doorstep start-ups where groups of farmers sell directly to consumers through regular deliveries to apartment complexes and gated communities (Bhumika 2016) and online orders and deliveries such as iRely.in

6.2 Formal Food Retail

With the rise in the number of wealthier families, including a growing number of international professionals who live and work in the city, new markets are emerging in Bangalore's urban food system. There is an increased demand for restaurants with global cuisine, as well as imported food items in grocery stores. However, locally owned shops, chains, and open markets for produce are still popular with many city residents and traditional Indian cuisine remains the staple. Imports of food ingredients into Bangalore from the US amounted to USD2.8 million in 2013, a 75% increase from the previous year (Jashnani 2015).

The kinds of food outlets in Bangalore, especially for fresh produce, are also changing. However, most of the evidence is anecdotal and based on personal observation, rather than from publicly available data or other evidence, since research on this issue is very thin. Table 4 shows the major food retailers in Bangalore. While stores such as these are gaining in popularity, many people still

prefer to shop at more old-fashioned family-owned shops. The main difference between the designated formats of the retailers is their size. A hypermarket is the largest with at least 6,000m², while a grocery store or gourmet store would be the smallest with at most 300m² and 500m² respectively. A supermarket falls somewhere in the middle and is specified as being between 1,000m² and 3,000m² (Jashnani 2015).

FIGURE 29: Modern Restaurant in Bangalore



Source: Jonathan Crush

FIGURE 30: Janatha Bazaar Supermarket in Bangalore



Source: Jonathan Crush

TABLE 4: Major Formal Food Retailers in Bangalore

Retailer	Format	No. of outlets in Bangalore
Metro Cash & Carry	Wholesale Mart	3
Tesco (Star Bazaar)	Hypermarket	2
Spar	Hypermarket	5
Foodbazaar	Grocery store	19
Hypercity	Hypermarket	3
Foodhall	Gourmet store	1
Spencer's	Grocery store and hypermarket	2 grocery stores and 2 hypermarkets
Heritage Fresh	Grocery store	12
Food World	Gourmet store, hypermarket and supermarket	40 (one is a gourmet store)
Total Super Store	Supermarket	4
Godrej Nature's Basket	Gourmet store	8
Smart Supermarket	Supermarket	28
Namdhari Fresh	Grocery store	3
Nilgiri's	Supermarket	3
<i>Source: Jashnani (2015)</i>		

According to Patil (2014), some companies, such as Namdhari, own land where they grow vegetables for distribution to their outlets. Others, such as Reliance Fresh and Food World, get their vegetables from HOPCOMS, RMC or the APMC yard. Some also buy directly from farmers in Devanahalli, Chickballapur and Kolar.

There are concerns with the Government of India allowing foreign direct investment in the retail sector, with many traders and farmers worried that the entry of large retailers like Walmart would threaten their livelihoods (Kruthika 2013). India has a long history of protecting farmers from market shocks with fiscal tools such as the minimum support price (MSP).

6.3 Informal Food Retail

Markets are an integral part of Bangalore's history. The old city is still shaped by the big markets and the surrounding streets (Nair 2005). The city's main markets – KR Market, Russell Market and Johnson Market – are relics of British rule and are considered heritage sites by UNESCO. While most markets sell a wide variety of goods, fresh produce (fruit, vegetables, meat, poultry and seafood) predominates. Farmers from peri-urban Bangalore and nearby rural areas supply produce to these markets. The markets also have expansive links to international fruit and vegetable trade chains. The vendors at these markets sell to large buyers, including hotels and restaurants, as well as to individuals. In addition, these vendors also supply most neighbourhood markets and smaller vendors.

FIGURE 31: Entrance to Krishnara Jendra Market

Source: Jonathan Crush

FIGURE 32: Market Stall in Russell Market

Source: Jonathan Crush

FIGURE 33: Vegetable Street Vendors



Source: Jonathan Crush

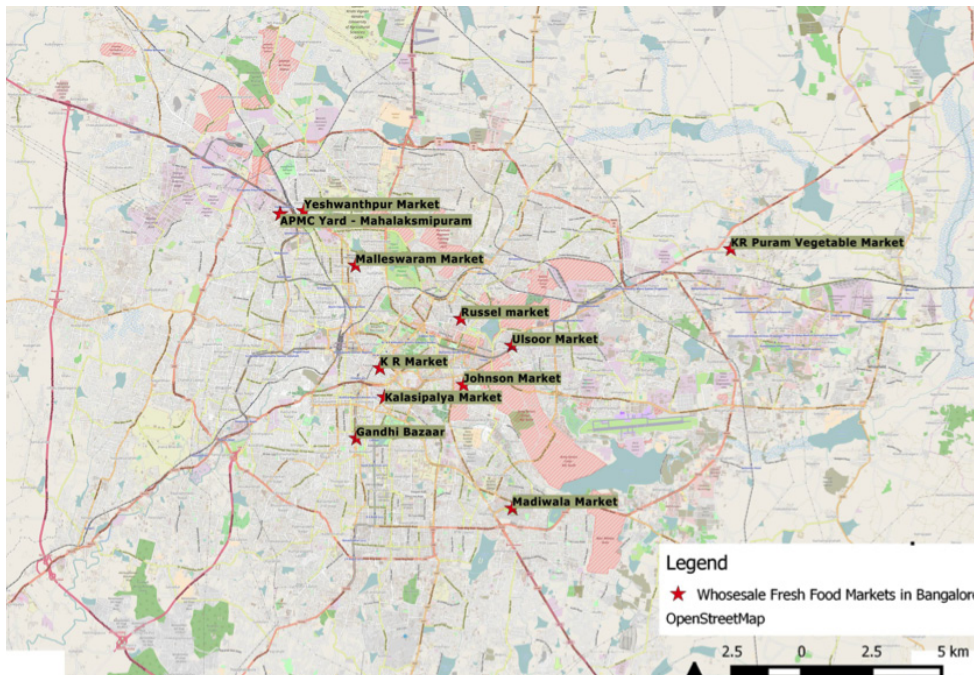
FIGURE 34: Trucks Delivering Fresh Produce to Markets



Source: Jonathan Crush

Figure 35 shows the distribution of wholesale fresh food markets in Bangalore. The city also acts as a node for the distribution of fresh produce, particularly onions and potatoes. Several state governments in India have set up Agricultural Produce Market Committees (APMC), which are essentially marketing boards to ensure that farmers are not exploited by intermediaries and also to ensure that food produce is first brought to a market yard and then sold through an auction. The state government of Karnataka has created APMCs in several towns, and most of these have a market where farmers, traders and vendors can trade produce. The APMC yard is located at Yeshwantpur, in north Bangalore (Figure 35). However, there are ongoing discussions to move it a few kilometres away to a larger facility, which has raised concerns about the impact on local livelihoods and employment (Francisi 2015).

FIGURE 35: Wholesale Fresh Food Markets in Bangalore



Source: IIHS Analysis

Markets in Bangalore have a complex system of traders and sellers that fall along a spectrum. There are own-account workers or individuals who source and sell single or multiple items of produce. Metres away are larger traders who source produce globally bringing the city's many restaurants, cafes and bars novel items of fruit, vegetables and meat. Throughout Bangalore, and even within specific markets, selling methods vary widely. Most of these differences are a result of complex social, political and regulatory relationships between the different vendors within the market, as well as between the vendors and the city government that regulates these markets. For example, in KR Market in the old city, it is

rare for women to own or sell produce at the formal stalls within the market, although several female vendors sell produce just outside the main market, or run small stalls on the floor of the main market. Vendors also vary in the way they choose to sell their goods: some sit on the ground, others set up a table, some use a movable cart, and others have their own stalls or shops. The products that they sell also vary from perishables, such as fruit and vegetables, to livestock such as chickens, to non-perishable items like toys or movies. Another distinction is the extent of variety of their goods. Some vendors sell only one specific product, while others have a variety within a certain category. There are also vendors who sell perishables and non-perishables, for example, a table with fruits and snacks as well as jewellery and other accessories. These informal economy enterprises employ a variety of strategies to make a living.

Russell Market, which was built while India was under British rule, is popularly known as a meat market but has many produce vendors. In the market's surrounding area are many hawkers selling goods similar to those that can be found within the market.

FIGURE 36: Poultry for Sale at Russell Market



Source: Jonathan Crush

FIGURE 37: Cut Fruit Stall at Russell Market

Source: IIHS

FIGURE 38: Vendor of Cooked Street Food Selling Fried-Bread Snacks

Source: IIHS

There is a diverse set of street vendors in Bangalore, both stationary and mobile, who sell a range of fresh, prepared and semi-prepared foods. It is also common for street vendors to sell using a pushcart through residential areas. These vendors often sell fresh fruit and vegetables purchased in the early morning at a wholesale market. Nataraj (2014) provides some insights into the structure and operation of informal sellers of cooked food in a small sample study. The study identifies three main categories of vendor in Bangalore: (a) street and mobile vendors who sell either from fixed locations or move around, generally prepare just one meal per day, do not have operating licences, serve a limited variety of dishes and have daily wage workers and local residents as their clientele; (b) semi-established enterprises that operate from a fixed owned or rented stand, often with a few tables and chairs, have operating licences, serve two meals a day, offer a greater variety of food and target students as well as wage workers; and (c) established enterprises that serve three meals per day, employ experienced cooks, serve a wide range of foodstuffs, and have a mixed customer base (Nataraj 2014: 30).

MOBILE STREET VENDOR

Valli is a 45-year-old woman who sells vegetables from her cart in Ulsoor. Two to three times a week, she takes a bus from Cox Town where she lives, and makes her way to City Market around 1.30pm. With a budget of INR4,000 on each visit, she buys vegetables based on the prices. If the prices are up, she buys about two kilos each of assorted vegetables; if they are down, she picks up about five kilos each. She then flags down an auto to Ulsoor and unloads about 50kg of vegetables on to her cart. Her cart is then open for business from 3pm onwards, until 9pm. In the mornings, from around 8am, she goes “rounding”, pushing her cart (which her brother Velayutham claims weighs 150kg when full) from street to street in the Ulsoor area, going from house to house to sell the vegetables. Once she has managed to sell the entire stock, she makes her way to the market again. This has been Valli’s life for the past 10 years. Valli makes a profit of INR500-600 on each cartload. On the day after she has bought the vegetables and the next, she can demand a good price. On the following day however, when the vegetables lose their freshness, she has to reduce prices. When the vegetables start to go bad, she says that there are poor people who will buy them from her. She adds, “I do not waste any of the vegetables. I sell the old vegetables at a low price even if it means that I incur a loss.” Valli is one of the three vegetables vendors catering to the residents of St Johns Road and Tank Road in Ulsoor. And like Valli, there are thousands of vendors selling vegetables across Bengaluru. One can spot a vegetable vendor on pretty much every other road, ranging from supermarkets to corner shops to cart sellers.

Source: Patil (2014)

FIGURE 39: Mobile Vendor Selling Bananas

Source: Jonathan Crush

FIGURE 40: Vermicelli Noodles Sold from Mobile Cart

Source: Jonathan Crush

FIGURE 41: Fruit Stall in Russell Market



Source: Jonathan Crush

FIGURE 42: Vegetable Stalls at Russell Market



Source: Jonathan Crush

6.4 Urban Agriculture

Although no Bangalore-specific information on food production is available, terrace and backyard gardening has always been popular. Bangalore has a culture of home gardens and terrace gardens and this is strongly promoted in the city. One example is the “Eat what you grow, Grow what you eat” movement started by Bangalore resident Dr Vishwanath Kadur (Chandra 2013). He hosts workshops and runs a Facebook group dedicated to the movement. In 2013, half of the group’s 6,000 members were from Bangalore. Since then the group has grown to nearly 28,000 members. Studies by organizations such as ATREE (Ashoka Trust for Research on Ecology and Environment) find that most city residents prefer to grow mangoes and coconuts and a variety of rose species (Ghosh 2013). Two recent studies of urban vegetation in Bangalore provide insights into the biodiversity of the city as well as the role of urban trees as a food resource. The first examined 44 urban slums in Bangalore and found that vegetation “played a major role in supporting nutrition by its role in food consumption, and in promoting health through the planting of species with medicinal use” (Gopal and Nagendra 2014: 2459). In all, 50% of the tree population had medicinal properties and a third were grown for their fruit (including cherries, mangos, figs and coconuts). There were many examples of innovative gardening methods in the slums with kitchen gardens planted in plastic bags, paint cans and buckets and located on windowsills, parapets and roofs. A second study focused exclusively on tree species in urban single domestic gardens and shared apartment gardens across the city (Jaganmohan et al 2012). The study collected data from 81 apartment gardens and 247 single gardens. Many species were ornamental but 35% of tree species and 23% of plant species were used as food or spices. However, many single unit gardens were being converted into smaller apartment gardens “indicating the challenges of protection of domestic gardens in a continuously expanding city with constraints of land availability” (Jaganmohan et al 2012).

7. HOUSEHOLD FOOD SECURITY

7.1 State Food Institutions

The Indian political system is a distinctive multi-party democracy with coalition governments and a loose federal structure, a central bicameral legislature and, until recently, a centralized planning system. India has a three-tiered government system: the national or federal level government, the state or regional level government, and city or municipal level government. Power and decision-making is typically concentrated in the national and state levels, meaning that city officials mainly perform service delivery functions. While this system has created

a strong national government and offered considerable autonomy to state governments, local government has suffered (Sami 2012). City governments tend to be weak and do not exercise independent decision-making. This affects how the food economy is governed at the local scale; for example, policies regarding the Public Distribution System (PDS) and welfare-based food access are typically made at the national level, with regional and local governments involved only in implementation. Also, given the fragmentation of governance structures, urban and regional government agencies rarely consider food and food economies as an explicit part of their function. There is some spatial regulation at the local level, but mainly from a land use and land regulation perspective.

Food provision has been a national development concern of India since before its independence from Britain in 1947. After independence, the state enacted legislation that protected the production and trade in essential commodities (such as grain, oil, and sugar). From 1955 to 1997, India had a system of universal public provision of basic food items that were distributed to households in both rural and urban areas through authorized distributors. The PDS for food and essential commodities, such as cooking fuel, was put in place by the Essential Commodities Act. The Act regulated the production, supply and distribution of commodities such as oil, wheat, sugar and rice. It also set up the Food Corporation of India, an autonomous body responsible for procuring these essential items.

In 1997, the PDS shifted from being a general distribution scheme to a food distribution scheme that specifically targeted the poor – the Targeted Public Distribution System (or TPDS). The TPDS (Control) Order 2001 regulated its operation by providing a legal framework and putting the onus on state governments to identify poor beneficiaries resident in the state. It also specified the mechanisms for central and state governments to identify beneficiaries, issue food grains, and distribute food from central to state governments.

Significant civil society intervention, along with judicial action in 2001, forced certain state governments to re-evaluate the TPDS. Numerous reports of leakages in the system, and severe food insecurity near rotting food grain, propelled civil society actors to propose changes to public food distribution. The Right to Food (RTF) Campaign gained significant traction and state governments, in particular, altered the way that beneficiaries were identified. The RTF Campaign also attempted to add a more human element to an issue largely relegated to administrative and statistical measures of destitution. Twelve years after the RTF Campaign began, the National Food Security Act (NFSA) was passed in 2013. The NFSA was bereft of many features that the RTF Campaign had fought for which looked at food security solutions in a holistic manner. But the NFSA 2013 did give statutory backing to the Targeted Public Distribution System, which the TPDS Control Order 2001 did not do. As a result, poor beneficiary populations now had a legal entitlement to food items.

The identification of beneficiaries has been a significant concern for political parties that have come into power in India from 1997 onwards. This has mostly been done through the creation and measurement of a poverty line. Due to the sheer scale of this public endeavour, India has one of the largest buffer stocks of essential food items after China. The NFSA 2013 has also created a legal entitlement to the Midday Meal Scheme, which combines the dual objectives of ensuring nutrition for young children while keeping them at school. The scheme aims to provide nutrition at school for every child of school-going age (until grade 8), and is implemented in a decentralized manner where local NGOs or individuals receive grain from public authorities, cook and deliver food to schools. One of the world's largest NGOs implementing this scheme, Akshaya Patra, is based in Bangalore. It provides lunches to children in government or government-aided schools and reaches over 1.4 million children across India. The goal is to feed 5 million children by 2020.

The neighbourhood public food distribution shop or a fair price shop is often called a “ration shop” in India. These shops sell wheat, rice, kerosene and sugar of average quality at lower-than-market prices. Other essential commodities may also be sold. To be eligible to buy items from the “ration shop”, one must have an identification card that signals that the household is “Below Poverty Line” or BPL. These shops operate throughout the country with the joint assistance of central and state governments. Recently, there has been a move towards replacing foodstuffs from PDS shops with cash entitlements. However, is being contested as these shops do allow poorer households, which form a significant part of the urban population, to access food.

The 2016 Hungry Cities Partnership household food security survey in Bangalore is the first city-wide assessment of levels of food security in the city. The results of the survey will be discussed in a forthcoming HCP report. Information is currently available on two contextual issues affecting food security – food prices and food safety – and these are discussed in the next section.

7.2 Food Prices

The share of food expenditure in total household expenditure in India is high (Anand et al. 2016). In India, this is measured with the Consumer Price Index (CPI), which calculates changes over time in the general level of prices of goods and services that households acquire for the purpose of consumption. The CPI is calculated by the Central Statistics Office, Ministry of Statistics and Programme Implementation, for three categories – rural, urban and combined. This data is only available at the country level and not at the state/sub-regional or city scale. For India as a whole, food accounts for 45% of the CPI basket (HSBC Global Research 2015).

In India, food inflation rose consistently between 2006 and 2014 and peaked in 2009 due to a drought (Bhattacharya and Sen Gupta 2015). This inflation was partly affected by the global food price crisis of 2007–2008. In response to the global crisis, the Government of India restricted exports of essential food items (wheat and rice) and common fertilizers to protect the state's food distribution responsibilities to below-poverty-line families (Ganguly and Gulati 2013).

Food price inflation was cereals-led in 2009 but this changed in 2010–2011 (Bhattacharya and Sen 2015). Price inflation persisted and was concentrated in a few commodity groups such as milk, fruit and vegetables, eggs, fish and meat (Shekhar et al 2016). This is highly problematic given how high the share of food is in India's consumption basket. Researchers attribute the inflationary pressure on certain food items like milk, meat and fish to rising incomes with accompanying demand for high-value food products. Regarding cereals, scholars suggest the rising costs of agricultural production and the government's minimum support price (Bhattacharya and Sen 2015). Edible oil and sugar are affected by global food inflation more than other food items. All-India trends can be used to illustrate fluctuations in food prices. The large share of food costs in household expenditure, coupled with robust growth in real income in the past decade, has resulted in significant increase in demand for food items (Anand et al 2016).

The supply of key agricultural products has not kept pace with real personal consumption growth. Indicative of this is the fact that growth in food prices has exceeded growth of non-food prices since 2006. Economists predict that the trend will persist and that India's national inflation dynamics will continue to be shaped by trends in food prices. In the first half of 2016, vegetable price inflation rose 10.77 % in May from 4.82 % in April, while the inflation rate for pulses increased 31.57% in May from 34.13% in April. Cereals and products inflation rose 2.59% as against 2.43% in April. Gokarn (2011) points out that over the past decade, the contributing factors of food inflation have changed. Cereals and sugar have played a smaller role in inflation compared to proteins, fruit and vegetables – a dynamic that played out in reverse in the previous decade. In the past four years, which roughly correspond to the most recent episode of persistently high inflation, the contributions of proteins and fruit and vegetables, in both absolute and relative terms, have clearly been the dominant drivers of food inflation.

In Indian academic, consulting and media reports, there has been significant speculation and tracking of the effects on food production of rainfall and monsoon success. The policy instrument of the minimum support price is a form of market intervention to protect farmers against sharp falls in prices during bumper production years. The minimum support price is usually higher than market rates, thus protecting farmers and incentivizing production (Balani 2013). At the same time, this guarantees a stable and fair price for government procurement

of food items for the public distribution system. While the centre procures food grains at the MSP, the price at which food grains are sold under TPDS is much lower. The centre sells food grains to states at subsidized prices, known as central issue prices. Hence, food subsidy is the difference between the cost (MSP and handling and transportation costs) and the issue price at which the public distribution system beneficiary buys food grains.

7.3 Food Safety

Food safety is a concern throughout India. Roadside stands selling food are popular, although vendors are often not allowed access to safe drinking water to prepare food items, or the infrastructure to maintain the integrity of food goods in hot summer months. There are also areas that may not have safe water, and so fresh produce washed with this water or grown with it can be unsafe to eat. Cases of food poisoning are not uncommon in India and Bangalore is no exception.

The Food Safety and Standards Authority of India, established under Food Safety and Standards Act of 2006, is the apex body regulating and enforcing food safety among manufacturers across the country. The authority's main function is to establish scientific-based standards for items of food, and regulation of their manufacture, storage, distribution, sale and import, in order to ensure availability of safe and wholesome food for human consumption. The regulations are monitored at the state level by state-level bodies. These regulations, however, are applicable only to food manufacturers. Similar regulations are not available for fresh food. There are very few state-based or city-based reports available on food safety in India.

8. CONCLUSION

This report has provided a broad picture of the food system in Bangalore, as well as the larger context within which this system functions. It focuses on the history and evolution of the city, a range of socio-economic characteristics, as well as on the food system not only in Bangalore, but also at the national and state levels. There is very little data publicly available at the city-scale on food and related issues. Most of the information contained in this report therefore relies on estimates based on national and/or state-level data. It also draws heavily on grey literature including newspaper articles and reports. There is a significant gap in our understanding of the urban food system and food insecurity drivers in Bangalore. Ongoing HCP research is working to fill this knowledge gap and will be published in future HCP Reports.

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Bangalore (officially Bangaluru) is one of India's fastest-growing cities. It is now the fifth-largest urban agglomeration in India, and the capital and primate city of the state of Karnataka in terms of area, population and economic output. With no natural features restricting its development, Bangalore's spatial growth patterns are characterized by urban sprawl. Although it accounts for only 0.4% of the area of Karnataka and about 16% of the total population of the state, Bangalore has the highest district income in the state, contributing approximately 34% to Gross State Domestic Product at current prices and is a magnet for investment and employment in Karnataka. The history of Bangalore is marked by two significant political developments: the Vijayanagara Empire in the 1500s and the British Empire in the 1800s. The patterns of urbanization that emerged from both forms of control – the British and the royal families – shaped current-day Bangalore. This report provides an overview of the city focusing on demography, spatial and physical growth, and governance structures. Although the focus is largely on food-related issues, it also provides a larger contextual picture of the city's evolution. While there is currently little detailed information available about Bangalore's food economy, or the larger food sector at the city scale, the report also includes information about national and regional policies and programmes that have an impact on local systems.



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