City profile

Chennai, India

Rashmi Krishnamurthy [a,*], Kevin C. Desouza [b,c]

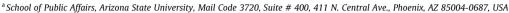[a] School of Public Affairs, Arizona State University, Mail Code 3720, Suite # 400, 411 N. Central Ave., Phoenix, AZ 85004-0687, USA
[b] School of Public Affairs, Arizona State University, 411 N. Central Ave., Mail Code 3520, Suite #750, Phoenix, AZ 85004-0687, USA
[c] Decision Theater, Office of Knowledge Enterprise Development, Arizona State University, 21 E 6th Street, Suite 126A, Tempe, AZ 85287, USA

A B S T R A C T

Cities around the world are experiencing tremendous population growth, and this is especially true in the developing world. In this profile, we feature the city of Chennai, the capital of Tamil Nadu, India. Chennai is the largest industrial commercial center in South India; it is often referred as the "Detroit of India" and the "Gateway to South India." In recent decades, large industrial facilities have been established in Chennai and its suburbs—resulting in large-scale population growth. However, this explosive growth has strained the urban infrastructure of this prominent city. In this profile, we provide an overview of Chennai's urban history from social, economic, political, and environmental perspectives. We highlight the current and future challenges faced by the city, and we argue that it is well poised to leverage emerging smart city technologies. However, to effectively implement these technologies, city administrators need to undertake several measures; for example, a database capturing all dimensions of the city must be developed. By clearly delineating the urban planning and policy efforts to the present and offering a way forward, this paper contributes to the growing literature on smart cities and the unique urban challenges faced by cities in the developing world.

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Introduction

In 2008, a report by United Nations (UN) Habitat concluded that half of the world's population now resides in urban areas and that within 2 decades, this number will increase to 60%. In addition, cities in developing countries are more likely to experience higher urban growth compared to cities in developing countries. Urban growth in developing world "is responsible for 95% of the world's urban population growth" (UN-Habitat, 2008, p. xi). Given this rapid growth, cities such as Chennai[1] (formerly known as Madras) are expected to become megacities[2] by 2025 (Joerin, Shaw, Takeuchi, & Krishnamurthy, 2014).

The explosive increase in the population of Chennai and its suburbs can be attributed to the tremendous growth in its industrial, educational, and health sectors. The metropolitan area is the largest industrial center in South India—it is often referred to as the

"Detroit of India" and "Gateway to South India" (U.S. International Trade Commission, 2007). With a population of 4.68 million, Chennai is now the fourth largest city in India (Census of India, 2011), and according to Tholons (2013), Chennai ranks fifth among the top outsourcing destinations in the world. The size of the manufacturing and IT sectors in particular attracts professionals from both other parts of India (both rural and urban) and foreign countries. In addition, many skilled and unskilled laborers migrate to Chennai in search of job opportunities. However, a portion of this migrant population ends up residing in slums (Viswanathan & Tharkar, 2010). According to the Census of India (2011), 28% of the urban population in Chennai lives in slums.

To meet the growing demands of its diverse population, city administrators have undertaken measures to revamp the urban space. For example, the government of Tamil Nadu commissioned a Second Master Plan to (1) guide the urban development in the city of Chennai and its suburbs and (2) develop satellite towns to offer efficient, effective, and timely services to their residents while maintaining a competitive edge in the globalized world (Chennai Metropolitan Development Authority [CMDA], 2008). The city administrators have made significant efforts to accomplish these two goals, such as by introducing e-services for birth and death certificates, property taxes, and an online public grievances system ("ELCOT to help corporation computerise all operations," 2009). While it is clear that Chennai administrators are taking

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[1] The City of Madras was officially changed to Chennai in 1996. During this time, many Indian cities were renamed. For instance, Bombay was renamed as Mumbai and Calcutta was changed to Kolkata.

[2] A megacity is a term used to describe a city that is home to more than 10 million people.

measures to meet the growing demands of its people, it is critical to find answers for the following questions: (1) what are the key urban planning challenges faced by the city? How can Chennai leverage IT to transform itself into a "smart city" to meet the growing demands of its residents, businesses, and tourists? How will the city ensure sustainable growth?

In this profile, we highlight the policy efforts undertaken by the city of Chennai to fulfill its vision of becoming a smart and intelligent city. More specifically, we discuss how the city administrators have harnessed IT to address challenges related to social, economic, and environmental issues. Furthermore, we explore the key efforts of urban planners and city administrators to redesign the urban space for inclusive growth and development. Discussion of these efforts is important for several reasons. First, many cities in developing countries are experiencing rapid urbanization. Second, many cities are increasingly experiencing challenges related to housing, employment, education, and culture. Third, due to the current global financial crisis, resources available to cities around the world are shrinking. Fourth, many cities are facing the challenge of designing and structuring urban space for inclusive growth. For these reasons, it is important to understand how cities leverage their social, economic, and intellectual capital to transform urban spaces and ensure sustainable development.

The rest of the paper is organized as follows. We begin by discussing the urban history of Chennai within social, economic, political, and environmental contexts. We then explore the present and future challenges faced by the city. Next, we evaluate the efforts undertaken by the city of Chennai to address its growing urban challenges. We conclude the paper by outlining the various opportunities and barriers that the city faces in addressing its pressing issues.

Background: overview of urban growth

The city of Chennai (Madras) has a long history, and its beginning can be traced back to the British East India Company. Under the direction of Mr. Francis Day, the East India Company acquired a grant to build a fort near the Coromandel Coast in 1640. The company began the construction of St. George Fort on March 1, 1940. The construction was completed in 1653. The East India Company encouraged merchants and artificers to settle around the fort, and the city of Chennai began to grow (chennaicorporation.gov, n.d.). The city of Chennai played a critical role in India's struggle for independence. After independence was achieved, most Indian cities were reorganized based on the linguistic identities of the local people groups; for Chennai, this was the Tamil. While Chennai quickly emerged as one of the fastest growing cities in India, due to the dominance of the Tamil (of Darvidian heritage), the city maintained an orthodox and conservative outlook (Arabindoo, 2011). Over past several decades, the city of Chennai has transformed from a commercial and manufacturing base to a growing IT hub. In this section, we provide a brief description of the city's location, demographics, economy, administration, environment, and urban infrastructure.

Location

Chennai is located between 12°50′49″ and 13°17′24″ latitude and 79°59′53″ and 80°20′12″ longitude on the Coromandel Coast off the Bay of Bengal. Chennai covers an area of 426 km². It sits on the southeastern coastal plain of India and lies closer to the equator. As a result, Chennai has a tropical wet and dry climate with little variation in temperature. The Cocum and Adyar rivers pass through the city (see Fig. 1).

Administrative structure

Chennai falls within the Chennai Metropolitan Area (CMA), which covers an area of 1189 km² and includes the city of Chennai, 16 municipalities, 20 town panchayats[3], and 10 panchayat unions (comprising 214 villages) in the Thiruvallur and Kancheepuram Districts (Fig. 2). The Corporation of Chennai[4] (CoC) serves as the region's governing body. The CoC is housed in the Ripon Building, which was built during British rule. The mayor serves as the political head of the CoC and is assisted by 200 councilors who are directly elected by the citizens of Chennai. The commissioner is the executive head of the CoC; a deputy commissioner, numerous department heads, and 15 zonal officers aid the commissioner. During the 2012–2013 fiscal year, it was estimated that the CoC's total revenue was 1326.11 crores (approximately $212.68 million) and that expenditures were 1232.97 crores (approximately $197.75 million) (chennaicorporation.gov, n.d.).

Demographics

Chennai's urban population has grown from 2.64 million in 1971 to 4.68 million in 2011 (Table 1). Various factors have contributed to the growth in migration, including large-scale investments from multinational companies (MNCs), growth within the automobile and manufacturing industries, the presence of foreign embassies, the growth of educational institutions, and cultural institutions such as dance and music (Achuthan & Ramakrishnan, 2009; Aggarwal, 2012). For instance, the total migrant population rose from 0.78 million in 1971 to 0.93 million in 2001.[5] In 2001, of the total population, the city recorded 21.57% migrant population from other parts of India and 1.7% migrant population from foreign countries. Additionally, the city has experienced outmigration to its suburb areas, mainly due to the conversion of city land space into nonresidential complexes, such as offices, hotels, and shopping malls. From 1991 to 2001, approximately 1 million individuals emigrated out of the city proper and into the surrounding areas. In addition, since 2000, Chennai has experienced an increasing surge of migrants from foreign countries (Venkatraman & Sivakumar, 2009). It is one of the three cities in India with the largest expatriate populations, with a growth of 35,000 in 2009 to 82,790 in 2011 ("India – exploring an Asian giant," 2013).

In terms of spatial area, since 1901, Chennai has expanded from 68 km² to 426 km². This natural growth—coupled with an influx of migrants—has forced the spatial expansion of the city. To effectively plan the urban growth of Chennai and its suburbs, the government of Tamil Nadu established a committee to outline a new city corporation for the city and its suburbs. After studying the patterns of urban growth, the committee proposed two models of expansion (Fig. 3): (1) megacity development involving an extension of the city's area from 176 km² to 800 km² or (2) smaller expansion (extending the area to 426 km²) coupled with the establishment of two more governing bodies to oversee the development of suburbs (Srivathsan, 2009).

When the government of Tamil Nadu first proposed CoC expansion in 2001, it faced stiff opposition in the assembly. Members of opposition parties questioned the rationale behind CoC expansion and proposed the establishment of new governing bodies to oversee the suburbs. However, the government of Tamil Nadu

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[3] The term *panchayat* is used to describe a local government body in India.

[4] The Corporation of Chennai is the oldest municipal institution in India. It was established in 1688 under British rule. The British Parliamentary Act of 1792 gave the Corporation of Madras the power to levy municipal taxes and govern the administration of the city. The current administration of the Corporation of Chennai is based on the Madras Municipal Corporation Act of 1919 (amended) (For more information, please visit http://www.chennaicorporation.gov.in).

[5] At the time of writing this paper, the provisional data from the Census of India (2011) were not available.