Livability assessment within a metropolis based on the impact of integrated urban geographic factors (IUGFs) on clustering urban centers of Kolkata

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ABSTRACT

The increasing drift of urbanization and its impact on urban and regional settings are a major concern for Indian cities. It draws the attention of policymakers and researchers on the growing distress towards the future of cities and community wellbeing. In this context, livability can be interpreted as a degree of interactions between citizens and their surroundings. Focusing on the Kolkata Metropolitan Area (KMA) India, the empirical research is endeavouring to assess livability variations of constituent urban centers based on Integrated Urban Geographic Factors (IUGFs). These factors represent the spatial interactive association of an individual with his/her urban environment. ‘K’ means clustering algorithm has been identified to delineate KMA into ‘K’ number of clusters. In the final segment, the research has forwarded the interpretation through a validation obtained from a spot opinion survey among residents of the selected clusters to comprehend the livability variations for ensuring all-inclusive wellbeing.

1. Introduction

‘The hope of a secure and livable world lies with disciplined non-conformists who are dedicated to justice, peace and brotherhood’. -Martin Luther King, Jr.

The decade of the 1980s has witnessed the rising interests for livability studies within Indian cities (Knox & Pinch, 2010) from an urban sustainability point of view (Kyyti et al., 2015). Ameliorating livability through socio-economic equity and reducing the environmental impact (Zanella, Camanho, & Dias, 2014) of various urban activities, were the prime concerns of this approach (Li & Weng, 2007). Over the years, several advocacy groups and researchers (Paul & Sen, 2017) have recommended livability research as an additive step to raise long-term sustainability within Indian cities (Giap, Thye, & Aw, 2014; Gough, 2015; Hutton, 2011).

Today, 54% of the world’s population lives in urban areas and this is expected to rise to 60% by 2050 in developing context (UN-Habitat, 2016). The increasing trend of population growth in Indian cities has created various impacts on the urban environment (Porio, 2014). It draws the attention on the growing distress towards the future of cities and community wellbeing (Moir, Moonen, & Clark, 2014). In this context, livability can be interpreted as a degree of interactions between citizens and their surroundings (Kim & Uysal, 2002; Pacione, 2003). In the domain of local context, the significance of livability is evident as the American Institute of Architects states that ‘livability is best defined at the local level. Broadly speaking, a livable community recognizes its own unique identity and places a high value on the planning processes that help manage growth and change to maintain and enhance its community character (AIA, 2005).’ Additionally, the rising importance of livability studies within developing nations has also noticed. In recent times for measuring urban livability within cities, the Indian government has decided to initiate a livability index for all cities based on population, basic infrastructure, historic importance, upkeep of heritage preservation, tourism, crime rate and public transit system etc. (Sharma, 2017). The present research is trying to assess livability variations of constituent urban centers within Kolkata Metropolitan Area (KMA) based on Integrated Urban Geographic Factors (IUGFs). IUGFs describe the spatial interactive association of an individual with their urban environment. Based on an increasing significance of livability in the intertwined context of urban environment and urban geography, the research tries to perceive the existing sub-regional variations ensure a significant understanding of livability governed by IUGFs.

2. Literature reviews

2.1. Significance of livability research in urban studies

Livability is a holistic paradigm (Jomehpour, 2015), as it reveals its significance for community wellbeing (Tilaki et al., 2014) and human
development (Wyatt, 2009). Its extents include many complex characteristics, urban patterns and forms (Bardhan et al., 2011). Livability also comprehends wide-ranging community desires to improve the overall Quality of Life (QoL) (Farber et al., 2016) and considers people’s needs for public amenities (Kennedy & Buys, 2009). Arrive at a gamut on the other hand, Douglass identified four pillars of livability (Uysal, Perdue, & Sirgy, 2012) i.e. direct investment in talent, access and control (Knox & Pinch, 2010). On the other hand, Douglass identified four elements of livability namely vitality, sense, fit, access and control (Knox & Pinch, 2010). On the other hand, Douglass identified four elements of livability namely vitality, sense, fit, access and control (Knox & Pinch, 2010). On the other hand, Douglass identified four elements of livability namely vitality, sense, fit, access and control.

2.2. Importance of IUGFs in livability research

Urban geography is a sub-component of Geography, emphases on the ways in which city and regional spaces are contrived, governed and succeeded. It is dealing with the spatial association between the communities and their surroundings. IUGFs are associated with a physical location that affects human living (Afandiyev, Eminov, & Nagiyev, 2014). These factors operate spatially (Pacione, 2003) to explain economic, socio-cultural and political processes and primary influence on the urbanization process (Teo, 2014).

IUGFs represent a critically important set of analytical tools for assessing the impact of human presence on the urban environment by measuring the result of human activity on physical assimilation. It deals with the normative, social and anthropological aspects within a space (Jacobs, 2012). Space can be better understood by an integrated approach (Bao et al., 2002), which is a lifeline of livability assessments. Numerous researchers have examined urban livability from physical extents (Horan, Serrano, & McMurran, 2016; Kytä et al., 2015; Shamsuddin, Hassan, & Bilyamin, 2012). The present research has evaluated livability from the social extents, an area which is relatively less explored (Fig. 1).

2.3. Assessment of livability within a metropolis based on IUGFs

Livability studies indicate possible aspects of IUGFs which might comprise its delineation. The present research is dealing with some selected studies to identify significant IUGFs for assessing metropolitan livability variations. Firstly, Li and Weng (2007) carried out a research to evaluates livability in Indianapolis, United States (Li & Weng, 2007) based on open spaces, population density, income, employment rate, education level and housing density. Secondly, Woolcock (2009) has conducted an extensive research on livability among various Australian cities to understand the research gap between the livability literature and its variables (Woolcock, 2009). It has identified healthcare, culture, education, infrastructure, public services, transportation, recreation and housing as major variables to assess livability. Thirdly, C. Owens (2009) has evaluated livability potential within Greater Vancouver. (Owens, 2009). The findings suggested that economic opportunity are a crucial variable in shaping the overall wellbeing. Lastly, M. Jomehpour (2015) has accompanied a livability research and identified transportation options, health cares, security as major parameters to evaluate community livability (Jomehpour, 2015).

To get an enhanced understanding the dimensions of IUGFs, the research has also evaluated several livabilities and QoL appraisals. For an example, firstly, a review of American Association of Retired Persons (AARP) livability index was concluded that a safe neighbourhood, affordable housing and transportation options, and supportive community services are the prime parameters of a livable space (Owens, 2009). Secondly, a further review of the Economist Intelligence Unit identifies green spaces, natural and cultural assets and connectivity (Economist Intelligence Unit, 2012) as the essential parameters for a livable city. Thirdly, Institute for Competitiveness India has initiated a livability index to rank Indian cities based on demographic aspects, educational facilities, health & medical standards, safety and security, housing options and economic opportunities (Kapoor & Garg, 2013). Form the above-mentioned studies, the present research has identified several IUGFs (Table 1), through which metropolitan livability assessment can be done.

3. Research methodology

3.1. Development of IUGFs

For an initial assessment, data were obtained from Census of India 2011. The research has consolidated a set of IUGFs with the help of several important studies (Table 1). The aim of the present research is to delineate the study area into various clusters, based on IUGFs. To ascertain the most important IUGFs which contributing metropolitan livability among the set (Table 1), an expert opinion survey has been conducted. Eighteen experts were identified from urban planning and urban science background and interviewed during July 2016 to August 2016. The survey was completed based on direct interviews and an online survey.

To understand the experts’ views on the importance of the selected IUGFs on the delineation of livability variations, weighted score approach has been used (i.e. 5 is most important and 1 is less important). Three IUGFs namely housing density, population density and the Employment rate have obtained for delineating the study area into ‘K’ number of clusters (Fig. 2).

3.2. Selection of urban centers

‘Calcutta has become a metropolis without benefit of the industrial
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امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
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پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات