Land Use Policy xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

Land Use Policy

journal homepage: www.elsevier.com/locate/landusepol

Evaluating place quality in innovation districts: A Delphic hierarchy process approach

Niusha Esmaeilpoorarabi[a], Tan Yigitcanlar[a,*], Mirko Guaralda[b], Md. Kamruzzaman[a]

[a] School of Civil Engineering and Built Environment, Queensland University of Technology (QUT), 2 George Street, Brisbane, QLD 4001, Australia
[b] School of Design, Queensland University of Technology (QUT), 2 George Street, Brisbane, QLD 4001, Australia

ARTICLE INFO

Keywords:
Innovation district
Place quality
Knowledge economy
Knowledge-based urban development
Delphi method

ABSTRACT

During the last decades, many cities across the globe have gone through a transition process, moving from traditional industrial economic activities to knowledge-based ones, for a sustained economic progress. These cities revised their land use policies to accommodate special zones for innovation activities—so-called 'innovation districts—to realise their knowledge-based economic development ambitions. The literature indicates that place quality of innovation districts is a critical success factor for the knowledge-based economy to flourish. However, so far there is no framework developed to assess the place quality of innovation districts. To fill this gap, this paper proposes an evaluation framework comprised of a set of indicators derived from three spatial scales (i.e., regional, city, cluster). Numerous indicators were gathered from the interdisciplinary literature, and then they were screened, validated, and finalised by 43 experts through an international Delphi survey. The analytic hierarchy process was also applied to derive the weights of the indicators. The paper argues that the framework is an invaluable tool as it has the capability to assist city administrators, planners and urban designers to assess and deliver high-quality innovation districts.

1. Introduction

Land use policy plays a critical role to empower local socio-economic conditions in cities and regions, and thereby helps in gaining a position in the global competitive markets. Today, global economy is in transition from the neoclassic industrial paradigm to a knowledge-based one—focusing on innovation, creativity, and symbolic values (Cooke, 2001; Bontje and Musterd, 2009). This transition pushed cities and regions to embrace new land use types and structural changes, to foster their standing in the knowledge economy (Boddy, 1999; Sarimin and Yigitcanlar, 2012). Cities and regions implemented strategies to upgrade their infrastructures, improve the quality of life, and create an attractive environment for the new knowledge sectors (Carrillo et al., 2014; Anttiroiko, 2015; Yigitcanlar and Bulu, 2015).

In this context, a new type of land use—namely "innovation districts"—has emerged, and become the nucleus of knowledge-based activities in cities and regions (Yigitcanlar et al., 2008a,b). Innovation districts represent neighbourhood-scale spaces, such as science and technology parks, research hubs, industrial precincts, and creative clusters, where knowledge- and innovation-based activities beneficially agglomerate together (Pancholi et al., 2014, 2015). The nature of such activities and their products are mostly intangible and rely on innovative ideas generated by educated and talented workforces; such workforces are referred to as knowledge workers, and are considered as a key asset for stimulating economic growth (Clifton, 2008; Pancholi et al., 2017a). Consequently, in recent years policy focus has extended from attracting investments and industries in urban localities to attracting human asset as well (Porter, 1998; Glaeser, 2005; Pancholi et al., 2017b).

This transition encouraged scholars to investigate the place attributes that foster, attract and retain knowledge workers and industries (Arora et al., 2000; Florida, 2005; Yigitcanlar et al., 2007; Asheim and Hansen, 2009; Clifton and Cooke, 2009; Frenkel et al., 2013a,b; Brown, 2015). These attributes are often labelled based on spatial scale (e.g., region, city, cluster) investigation. For example, capital system, quality of life, and quality of place attributes are respectively assigned to denote the quality of region, city, and cluster (Carrillo, 2004, Craglia et al., 2004; McCann, 2004, Heebels and Van Aalst, 2010; Durmaz, 2015; Esmaeilpoorarabi et al., 2016b).

Nevertheless, previous studies mostly focused on regional and

* Corresponding author.
E-mail addresses: niusha.esmaeilpoorarabi@hdr.qut.edu.au (N. Esmaeilpoorarabi), tan.yigitcanlar@qut.edu.au (T. Yigitcanlar), m.guaralda@qut.edu.au (M. Guaralda), md.kamruzzaman@qut.edu.au (Md. Kamruzzaman).

https://doi.org/10.1016/j.landusepol.2018.02.027
Received 22 December 2017; Received in revised form 10 February 2018; Accepted 13 February 2018

city scales, and overlooked the role that place quality can play in innovation districts—location of the day-to-day live-work-play activities—for attracting knowledge workers and industries (Evers, 2008; Kloosterman and Trip, 2011; Gu, 2014). More importantly, most of the studies ignored the synergies across different scales—e.g., whether the quality of life can be traded of with place quality. Equally so, although scholars agreed on that place quality is a multidimensional construct, the literature lacks a sound framework for the evaluation of place quality in innovation districts. This limits our understanding whether place quality is a local level phenomenon and bounded by the features within a cluster or what attributes of a region/city can affect the place quality of a cluster.

This paper aims to develop a framework that can validly measure the place quality of innovation districts. As the methodological approach it adopts a Delphic hierarchy process approach. The study identifies a large pool of indicators through a comprehensive review of the literature, then evaluates their suitability through an international Delphi survey involving 43 experts. By doing so, it classifies suitable indicators, and hence establishes a multidimensional and multiscalar framework of place quality in innovation districts. The framework, as an evaluation tool, has the potential to inform the planning, design, development, and management processes of innovation districts.

2. Literature review

Combining a thick pool of knowledge workers with world-class infrastructure, amenities and global markets is a current strategy to nourish the growth of innovation districts (Esmaeilpoorarabi et al., 2016a; Pancholi et al., 2017c). Thus, to systematically foster, attract and retain knowledge industries and workers, one needs to realise where they choose to locate and why. With respect to the importance of the economic factors and work conditions, knowledge workers no longer tend to locate where solely the jobs are (Yigitcanlar et al., 2007). They chose their locations based on specific place qualities and lifestyle options, which fulfil their sophisticated needs and fits their creative identities—i.e., residential amenities, authenticity, quality of meeting places for business and leisure purposes (McCann, 2004; Kloosterman and Trip, 2011).

Place quality does not solely relate to the built environment quality. Natural environmental qualities are fundamental assets at the regional, city and cluster scales, and through effective sustainable urban development practices industrial and urban symbiosis are in the process of merging in many urban locations (Arbolino et al., 2017; Taddeo et al., 2017; Aquilani et al., 2018). Indirectly, high-level place quality also influences where knowledge industries locate as they seek places with the highest concentration of talent (Florida, 2005). Therefore, enhancing place quality is an effective approach to attract knowledge workers and industries, gathering agglomeration of talents, and forming an attractive socioeconomic platform.

Number of studies have highlighted these characteristics of urban environments as ‘quality of place’, and emphasised that place quality mostly relies on the intangible conditions of a place (or in other words soft factors)—e.g., urban ambiance, socio-cultural characteristics, level of diversity, tolerance and openness of the population (Florida, 2005; Bereitschaft and Cammack, 2015). However, the importance of soft factors does not totally detract the relevance of hard factors as reported in many studies, such as investment availability, job opportunity, cost of living (Storper and Manville, 2006; Storper and Scott, 2009; Darchen and Tremblay, 2010; Scott, 2010; Alfken et al., 2015).

There is also a third approach, which claims an attractive place should be capable of offering ideal conditions both in terms of hard labour market and economic factors, as well as soft quality-based factors (Brown and Mczyski, 2009; Yigitcanlar and Dur, 2013). Recently, this combined approach has gained popularity (Bontje and Musterd, 2009; Boren et al., 2013; Durmaz, 2015). Such balanced viewpoint is also important to support place quality in innovation districts. This research, hence, suggests a multidimensional set of combined hard and soft indicators for investigating place quality in innovation districts.

There are also fundamental relations between different geographic scales that need to be considered in evaluating place quality at the cluster scale (Kitson et al., 2004). Place quality is not an isolated phenomenon; it is dramatically influenced by the performance of the city and region that host the cluster. At the regional scale, place quality is usually studied through a ‘general capital system’ (Carrillo, 2004; Carrillo et al., 2014). The capital system focuses on the assets of urban spaces as a whole (Sotarauta and Linnamaa, 2001). It is a sustainable combination of visible—e.g., physical structures and environment—and invisible assets—e.g., human and cultural values—of a region.

These regional assets aim to provide macro-scale requirements of knowledge-based growth, and empower the performance of cities and their innovation districts (Yigitcanlar and Dur, 2013). At the city scale, place quality is strongly related to quantity and standard of amenities provided, which are known as ‘quality of life’ (Ballas, 2013). In comparison with the regional scale, cities are more prone to subjective factors and personal perception of place—e.g., life and job satisfaction, wellbeing, happiness (Malkina-Pykh and Pykh, 2008). These characteristics of cities play a critical role in shaping their attractiveness (Marans, 2003); consequently, improving the quality of life in turn enhances the ability of cities to attract a thick pool of talents and investments—which in return empowers innovation districts (Santos and Martins, 2007; Morais et al., 2013).

At the cluster level, knowledge workers resonate with certain characteristics of the day-to-day urban environment; this touchable scale of place is where personal and social life happen, is the soul of the dynamic interaction between people and their routine/environment (Clifton, 2008; Heebels and Van Aalst, 2010). Place quality at the cluster scale can be assumed as personal experience at street level, where knowledge workers enjoy different types of entertainment—e.g., music, food—as well as different ways of socialising (Darchen and Tremblay, 2010). The cluster scale fosters the connection of firms and individuals and spill over of knowledge (Arora et al., 2000).

This research proposes a multidimensional and multiscalar conceptual framework for measuring place quality in innovation districts, which considers the interactive connotation of various geographic scales. Fig. 1, the conceptual framework, represents the distinctive nature of place quality elements at various geographic scales, which contribute in creating attractive innovation districts. Dimensions of the general capital system, quality of life, and place quality are retrieved respectively from Carrillo (2004), Ballas (2013), and Esmaeilpoorarabi et al. (2018). These elements are expanded and examined in detail in the following sections.

3. Empirical investigation

3.1. Methodology

After reviewing the interdisciplinary literature and best practices, the conceptual framework (Fig. 1) is expanded into a detailed framework that contains the factors or indicators of place quality at regional, city and cluster levels (Table 1). A Delphic hierarchy process approach—using the Delphi method and analytical hierarchy process (Khorramshahgol and Moustakis, 1988)—is adopted as the methodological approach. Firstly, the framework is validated through an international Delphi survey by the eminent experts of the field to determine adequacy and accuracy of the indicators. In consequence, the study developed an evaluation model, which can