# CLIMATE CHANGE CHALLENGES IN URBAN PLANNING: THE ROLE OF GREEN ENVIRONMENT FOR SUSTAINABLE WORKPLACE ENGAGEMENT AND BUSINESS ENTERPRISE GROWTH

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ABSTRACT
The article examines the role of green environment, which on the one hand helps to adapt urban areas to climate change from environmental perspective, and on the other hand may catalyze sustainable workplace engagement of knowledge-intensive workers. This sustainable urban planning approach aims to achieve more resilient city in terms of improved environmental quality, business enterprise growth and better mental and physical health conditions of knowledge workers. All of these issues referred to green economy principles. The paper presents the overview of the research, which will be conducted at University of Reading (United Kingdom), based on the case study of the most developed economic region in Great Britain (Central London and Thames Valley, Berkshire). The project aims to improve smart urban planning of the area, making it more entrepreneurial, and at the same time increase productivity of the region to be able to better cope with future challenges.

## 1. INTRODUCTION

This chapter aims to identify and critically review existing research relevant to investigation of the relationship between the urban built environment and the workplace engagement of employees, who are the main resource of successful knowledge-intensive business enterprises driving economic growth in the 21st century (European Commission, 2012). The full literature review considers relevant key terms, concepts and scholarly perspectives referred to in cognate academic disciplines, in order to establish a sound theoretical framework for this research.

Reflecting the association identified between workplace engagement and higher productivity (Bakker and Demerouti, 2008), business enterprise growth is understood in this research as reflecting employee wellbeing, which has become the subject of much recent research in a number of disciplines (for example, Grawitch et al., 2006; Institute of Directors, 2006; Juniper, 2011; Nielsen and Noblet, 2018; Gillen et al., 2018). Despite considerable existing research into the influence of the urban built environment on general human well-being (Guite et al., 2006; Van Kamp et al., 2003; Dannenberg et al., 2011), there is still a lack of empirically documented research on urban built environment quality based on hard environmental (Brandon and Lombardi, 2010) and associated infrastructure data (e.g. quantity/quality of green and grey networks), and specification of how these conditions impact productive business enterprise in terms of the wellbeing and workplace engagement of employees.

It has recently been contended, that the well-being of workers in compact high density urban environments where knowledge-intensive companies agglomerate, can be compromised by a deficiency of external open spaces and by high levels of traffic emissions and associated poor air and green environmental quality, with long run consequences for public health, productivity and inward investment (Pain, 2019). The environmental context in a broad sense, of the knowledge-intensive business workplace may therefore have critical importance for the sustainable wellbeing of knowledge

workers, productive business enterprise and economic growth. However the current research mainstream on workplace health and well-being has long been focused only on the internal office environment (Mallawaarachchi et al., 2017; Rashid and Zimring, 2008). The overarching objective and the dominant focus of the article intends to give specific attention to the *outdoor* urban environmental conditions that may influence the wellbeing and engagement of knowledge workers in two case study workplace environments in different urban settings.

**Overall research aim:**

By providing new scientific insights into the quality of the urban environment with reference to the examples of knowledge-intensive companies located in two of the most economically successful business clusters in the United Kingdom (Central London and the Thames Valley, Berkshire), the research sets out to inform urban planning on specific environmental conditions that can support (and alternatively compromise) sustainable workplace engagement for the growth of productive business enterprise.

**Main research questions:**

Research Question 1: What specific outdoor environmental conditions of the urban workplace impact the well-being and engagement of workers employed in knowledge-intensive business enterprise?

Research Question 2: What is the influence of specific business enterprise location on the quality of the urban knowledge-intensive workplace environment that is conducive to the engagement of employees?

**Data required to inform these questions based on preliminary investigation:**

- To identify outdoor environmental conditions of urban built environment which may influence the wellbeing and workplace engagement of knowledge workers (RQ 1), hard secondary data from existing studies on environmental factors influencing human general health condition and well-being, e.g. air pollution, temperature, noise level etc., will be assessed using, for example, the United Kingdom data service (https://beta.ukdataservice.ac.uk/);
- to model the relationship between outdoor urban built environment conditions and workplace engagement (RQ 1 and RQ 2), behavioral insights into subjective knowledge worker experience of wellbeing and workplace engagement together with associated experiences of daily commuting, air quality, etc., will be surveyed through a series of linked qualitative and quantitative fieldwork interventions with the agreement of two selected knowledge-intensive companies and consent of their employees;
- to facilitate identification of the influence of specific business enterprise location on the quality of the outdoor urban workplace environment and the engagement of employees (RQ 2), the two knowledge-intensive companies to be the basis for the above field research, are located in different case study areas: Central London and the Thames Valley, Berkshire.

**Unique contribution to academic knowledge of the research:**

The research aims to contribute new knowledge and understanding to existing academic literature by adding empirical insights into the relationship between urban environmental quality *external to the workplace*, and knowledge worker wellbeing and engagement which impacts the growth of productive business enterprise.

The research is expected to provide a new perspective and new scientific insight into the relationship between urban planning which has an important role is shaping urban environmental quality, and business, where the concept of the 'built environment' is not limited to buildings per se. Whereas much previous research has focused on the internal space of commercial office real estate, external urban environmental quality conditions are likely to constitute missing/confounding variables in analysis of wellbeing and workplace engagement, and these will be the novel focus of the research.

The research is also expected to contribute to theoretical debate concerning the concept of 'green economic growth', defined by UNEP (2010) as improving human well-being and social equity while significantly reducing environmental risks and economic scarcities (2010, pp. 418-19). Controversy surrounding the concept which attempts to bring sustainable development goals for economic growth and environmental sustainability into alignment (see for example, Blowers and Pain, 1999; Wagner and Schaltegger, 2002; Hahnel, 2010; Brand, 2012; Kennet and Kamarudin, 2012; ICC, 2012), is pertinent to the aim of this research to grow enterprise and *sustainable* workplace engagement through better informed urban planning.

**Practical implications of the research:**

By shedding light on urban environmental conditions associated with knowledge worker wellbeing and engagement, the results of the research can be expected to inform decision-making of both public and private sector business actors that is relevant for the promotion of productive enterprise combined with a healthy environment. A potential research outcome is public sector planning and business investment in urban development and environmental improvements in locations where the ratio of workplace engagement will potentially be higher.

## 2. CONTEXT TO LITERATURE REVIEW - CITIES AND BUSINESS PRODUCTIVITY

A large scholarly urban and economic geography literature has established the key role that specialised knowledge and innovation in city clustered business enterprises plays in generating positive externalities and spillovers (Barba Navaretti and Venables, 2004) and boosting Gross Domestic Productivity (GDP). Jacobs (1970) saw innovative export-oriented 'new work' conducted by business enterprises as creating city economic vibrancy that spills over metropolitan boundaries to create economically vibrant regions. Sassen (1991, 1993) developed this line of thinking, drawing to attention dual processes of the dispersal and concentration of knowledge-intensive financial and business 'Advanced Producer Services' (APS) enterprises providing services to 'Multi National Corporations' (MNCs) worldwide. She argued that these twin processes generate a select group of 'global cities' where command and control functions in global APS servicing global capital are densely clustered. Building on Sassen's global city thesis and in the context of late twentieth century advances in information and communications technologies, Castells (1996) conceptualised information flows within the city located global APS networks, as interlinking cities globally at diverse geographical scales. Drawing on the foregoing thinking, Scott (2001) contended that the high connectivity in multi-scale knowledge and innovation rich business networks of dense global cities, is leading to the emergence of extensive 'global city regions' with superior commanding roles in the twenty first century interlinked world economy.

Numerous authors within this interdisciplinary literature, have emphasised that innovation and flows of information, and interactions within and between knowledge-

intensive, business enterprises, not only contributes to the development of agglomerated expert urban labour pools but also diffuses high-value know-how and technologies within densely developed cities and regions (Anderson, 1990; Barro, 1991; Mahroum et al., 2008). Unlike primary and secondary sector industries, for these knowledge-based enterprises, the talent, knowledge and work engagement of their specialised human resources is their capital (Taylor et al., 2003; Pain and Van Hamme, 2014; Schaufeli and Salanova, 2007; Bakker and Demerouti, 2008). However, a recent global quantitative study of 63 leading business cities found a risk to the health, well-being and functioning of urban workers and residents associated with high density development. In a recent study of 63 cities, densely developed compact urban form has been shown to be beneficial for synergies between specialised labour supply, financial business service (APS) enterprises agglomeration economies, and innovation, for reduced carbon emissions per capita, and for real estate investment capital flows and returns that are critical for cities to service global capital (Pain et al., 2018). The study calls for further empirical research to inform appropriate urban and regional spatial planning measures to take into account density risks - loss of urban open space and deterioration of green environmental quality which offset pollution from emissions, impacting air quality and global warming (Pain, 2019). As Cheshire, 2016 observed, 'Enhancing the built environment cannot promote prosperity or happiness in itself – but can if it improves people's lives or productivity and is critical in helping cities deliver welfare and productivity more effectively' (https://www.thebritishacademy.ac.uk/blog/bigger-cities-are-more-productive-higher-cost-what-policy-could-do-doesn%E2%80%99t). In consequence, this PhD research focuses on the space external to the densely developed knowledge-intensive urban workplace and will shed new light on current research on internal office space, affecting worker health and engagement (Miller et al., 2009; Vischer, 2007; Erlich and Bichard, 2008).

The research aims to investigate these urban density related environmental risks specifically in relation to the engagement of workers in knowledge-intensive, innovative business enterprises. The research will take the densely clustered City of London and the adjacent Thames Valley, Berkshire, which comprise the most highly connected global city region in the world, as an example due to their agglomeration of cutting-edge international APS and linked high-technology, specialized workers (Taylor et al., 2006; Pain et al., 2018)

Two main areas of relevant literature are selected for attention in this summary review:

1) Green environment literature (relevant to space external to offices in densely developed cities);

2) Workplace engagement literature (relevant to knowledge work and productivity).

## 2.1. GREEN ENVIRONMENT

Authoritative forecasts by reputed international agencies, predict that the worldwide urban concentration of productive business, coupled with rural to urban migration, will continue during the twenty first century, leading to an urban world demography with workplaces clustered in cities (UNDESA, 2015; World Bank, 2013). This phenomenon has been found to reduce carbon emissions per capita but to increase total emissions (Christen, 2014; Kellett et al., 2013) in large, dense cities. Together with other urban emissions, such as particulates and nitrous oxide, there are negative impacts on the urban natural environment, human health and the wider planetary ecosystem (Millennium Ecosystem Assessment, 2005). The horizontal and vertical

transportation of emissions across space results in high levels of air pollution in dense urban locations which are places where large numbers of knowledge workers are employed (Barlow et al., 2017; Pain et al., 2018) and where knowledge is the vital resource for advanced economies (Van Winden et al., 2013). Therefore, a holistic and smart approach to urban planning has been called for to ensure that cities are developed according to the established environmental knowledge (Pearson et al., 2014; Beatley, 2011), taking into consideration wellbeing and happiness as well as the new urban knowledge economy paradigm (UN, 2012). The relationship between urban infrastructure, productivity and environment has been highlighted in the recent United Kingdom Industrial Strategy as a foundation for productivity to transform future economy of the UK through ideas, people, infrastructure, business environment and places (HM Government, 2017). The research will build on this nexus and contribute to existing research on this topic.

There is much ongoing research regarding the concept of knowledge-based urban development (Knight, 1995; Yigitcanlar et al., 2008; Carrillo et al., 2014), focused on making cities more competitive, livable and globally oriented (Sarimin and Yigitcanlar, 2012); however, existing conceptualisation does not incorporate a focus on the environmental quality of the urban realm, which is to be investigated in the research, as an underlying contributor. Yet, environmental literature indicate, that health and wellbeing of knowledge workers that result from environmental conditions, should be one of the main priorities of knowledge-based development. Moreover, ensuring the environmental quality of large cities also seems necessary from the perspective of literature proposing a green economy to limit urban and global environmental and climate change. This research gap, will be investigated in the research based on empirical study and an insightful contribution to theory.

Despite being a contested topic, many authors consider sustainable urban form as compact high density development (Williams et al., 2000, Neuman, 2005), which is representative also of knowledge-intensive business agglomeration and high property and land values. However, whether compact, high density urban form is synonymous with 'good density' requires quantitative and qualitative consideration (Clark and Moir, 2015, ULI, 2018) of the quality of the urban built and natural environment which impact the wellbeing of knowledge workers as well (Pain et al., 2018). The research will apply both of these methods to measure, for example, how knowledge-intensive workers function and behave (e.g. walking, cycling, using public transport etc.) in a dense urban location and how this influences their self-assessed wellbeing and workplace engagement. The study will investigate the research gap regarding density of urban form, wellbeing and sustainable workplace engagement experienced by a sample of knowledge workers. The findings resulting from the research observations are expected to lead to better understanding of the connection between 'good density' and a green economy in the context of knowledge workers.

Research conducted at Stanford University has documented the positive impact of walking on creative thinking (Oppezzo and Schwartz, 2014). However existing findings on urban characteristics associated with good density on found a lack of existing empirical data on the quality of walkable urban open spaces (Pain et al., 2018). The positive impact of the natural environment on a city's sustainability has been broadly documented, but providing quantitative evidence of the economic benefits of urban green spaces has thus far proved challenging. Proximity to open green spaces has been found to influence housing real estate market prices (Gomez et al., 2010) and a network of green spaces has been shown to play significant role in ecosystem services (Konijnendijk et al., 2013). Moreover, green infrastructure is crucial for sustainable urban drainage systems and climate change mitigation, which has meaningful economic

benefits at a city scale (Merriam, 2010) and minimizes urban heat island effects on a district scale (Bo-ot et al., 2012). The monetary value of green infrastructure has been recognized (The City of New York, 2010). As noted by Milani (2000), green environment is therefore contended to be an integral part of a green economy. Therefore, the research will add a new business perspective to existing literature relevant to green economy conceptualization by investigating the relationship between the urban environment and sustainable workplace engagement. The literature reviewed demonstrates that there is a void of research on this aspect of green economic growth, and the results may potential have a significant impact on smart urban planning.

The importance of connectivity and high-quality smart transport systems have been also highlighted in research by Esmaeilpoorarabi et al. (2018). Brandon and Lombardi (2010) among others, noted that connectivity in terms of communications remains critical in the global economy (e.g. air, high-speed trains, ICT). An example of incorporating blue infrastructure into urban transport planning, e.g. ferry systems operating along urban waterfronts, exemplify how urban interventions may promote environmental and human wellbeing whilst, at the same time, contributing the urban economy (Camay et al., 2012). The research will include examination of current communication configurations in the South East of England within and between Central London and the Thames Valley case study areas in relation to traffic emissions. This aspect of the field research task will address a research gap concerning how the geographical location of business hubs impacts air quality through present communication modes and also influences locally experienced knowledge worker wellbeing and engagement.

## 2.2. WORKPLACE ENGAGEMENT

The topic of employee engagement has been subject to the attention of many authors. Both 'grey' and academic literatures have linked better employee and organizational outcomes with financial success (Baumruk, 2004; Harter et al., 2002; Richman, 2006), as well as organizational competitive advantage (Macey et al., 2009). Many definitions of engagement are cited in the literature. For example, Kahn (1990) defined personal engagement as 'the harnessing of organization members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances' (p.694). Schaufeli et al. (2002) defined engagement as 'a positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption' (p.74). It has been reported, that substantial lack of engagement leads to lower productivity of organizations (Johnson, 2004). As noted by Saks (2006), there is a growing need for understanding of how to promote employee engagement. There are currently two scientific mainstreams which try to provide answers to this question.

The first scientific mainstream evolved in the social science literature, which focuses on office social environment and psychosocial factors that affect job performance (how workers interact and behave with each other), and where 'engagement' per se is understood as a result of managerial processes. According to this type of research the company itself is a driver of employee engagement and productivity (Irvine, 2009, Bakker and Demerouti, 2008, Anitha, 2014). The factors determining employee engagement are, for example, work environment (understood as social rather than physical environment), leadership, team and co-worker training and career development, compensation, organizational policies and workplace wellbeing. As noted by Brinkley et al. (2010), employers can influence employee wellbeing through provision of healthy lifestyle choices (e.g. gym membership, healthy canteen food).

However, according to this approach, 'engagement' is 'being managed' within the internal physical working environment. As noted by May et al. (2004), 'engagement is important for managers' (p.14).

The present research will investigate the relevance of engagement for the attention of urban planning and business investment but, in the light of evidence on potential associations between employee engagement, well-being and external environmental conditions, the research aims to identify physical factors external to office space, which may influence knowledge workers' wellbeing, engagement and performance. It therefore draws on environmental research to explore how current public and private sector thinking might take into consideration the relationship between sustainable workplace engagement and environmental characteristics and quality of the urban realm to impact business enterprise growth. The research continues the debate on green economic growth by carrying out empirical investigations to identify important drivers of sustainable workplace engagement of knowledge workers in terms of the external physical environmental factors and how their significance is perceived. Therefore, empirical methods used in applied sciences will assist the development of new insights in this field, as traditionally researched through a social sciences lens.

The second scientific mainstream regarding engagement is based on research on 'green' buildings and environmental factors influencing internal office working space. This is an outcome of growing interest in the general health and wellbeing of the workforce, which has been identified as an important issue for the knowledge economy because it reduces costs of employers and society and can lead to increased productivity (Brinkley et al., 2010). Many scholars have studied the quality of the internal physical office environment (office design and the physical qualities of the building) and how these impact employee job performance (Wyon, 2004; Kwallek et al., 2007; Clements-Croome, 2004; Vischer, 2007; Kegel, 2017; Chan et al., 2007; Chadburn et al., 2017; Feige et al., 2013). The internal office environment is assessed according to physical environmental factors (e.g. ventilation, natural/artificial lighting, heating) and design factors (e.g. ergonomic furniture), which impact mental health and physical states of wellbeing and general job performance. Findings from this stream of research are being applied in the real estate industry worldwide (specifically via the green buildings sector which calls for Energy Star-labeled or LEED-certified investments), which is concerned with developing a healthy working environment in order to reduce sick leave and improve the overall performance of knowledge workers. In such studies, the internal office environment is indeed a driver of increased productivity in the knowledge-intensive sector. However, the proposed research will provide insights into the external office working environment and how this impacts workplace engagement. Tin addressing this research gap that is waiting to be filled, the research takes into consideration the external environmental quality of the urban work space and will highlight key issues for public sector urban planning and commercial real estate investment. The findings will shed new light on the potential role of urban planning in promoting workplace engagement in a more holistic way and on the potential role of business enterprise in promoting 'green growth'. The research will therefore fill the present void in studies on green economic growth in its broadest sense (Milani, 2000).

## 3. CONCLUSIONS

In light of the present state of knowledge and understanding on the link between wellbeing of the knowledge workforce and its relevance for engagement, further research is necessary to identify specific urban adaptations that will be conducive not

only to sustainable human wellbeing but to productive business enterprise. The literature reviewed demonstrates that workplace engagement is now regarded as an important driving force of productivity and that it is a subject of growing interest of business enterprises, real estate companies and researchers in the social sciences and health fields. However, it can be observed, that existing studies focus on the internal office environment, which is understood both as a social and a physical environment. There currently exists very little empirical work on how the conditions of the external office environment can enhance or reduce employee wellbeing and engagement and on planning and investment interventions that could foster both wellbeing and productive business enterprise. This is the research gap, upon which will the research be focused in two different case study locations. Theoretically, the research will also contribute to academic discourse in the literature on the conceptualization of green economic growth by providing a more holistic understanding of a green economy where the urban environment outside the office, can enhance sustainable productive work and enterprise through better informed public and private sector urban planning and investment decision-making.

The overarching hypothesis is that the external environment which is shaped by private sector investment and urban planning, can be a key driver of knowledge worker wellbeing and productive engagement, also benefiting an urban green economy (understood as better environmental quality and higher level job performance) in a more holistic way. If this hypothesis is defended, environmental quality considerations should be embedded within broader city planning and business investment priorities in order to better address future urban challenges for healthy knowledge workers and productive enterprise and growth.

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