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The Climate-Planning Nexus: Situating Local Institutions in the Climate Emergency

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Being a dissertation submitted to the faculty of The Built Environment as part of the requirements for the award of the MPlan City Planning at University College London: I declare that this dissertation is entirely my own work and that ideas, data and images, as well as direct quotations, drawn from elsewhere are identified and referenced.

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Abstract

Climate change as a potential threat to societies, especially urban societies, has long been recognised not only by scientists but also by the international planning community decades ago. However, the fact that there is still a climate emergency nowadays may be an indication of inadequate response in the past despite early recognition. Recognising that planning has been perceived as both an opportunity and challenge to tackling the climate crisis, this research seeks to explore the processes through which attempts were made by local institutions, or local governments, to integrate the climate emergency agenda into the planning. Through a nexus approach to understanding synergies between the governance of climate change and planning, informed by an established framework of integration, potential opportunities and barriers for local institutions to realise and optimise the climate-planning nexus are evaluated. Lessons are drawn in relation to how, and the extent to which local institutions can build capacities for addressing the climate emergency agenda in an integrative through planning.

1. Introduction

Accelerated climate debates and activism following a series of publications and actions have fueled global momentum for adopting the 'climate emergency' agenda (Davidson et al., 2020). This trend is underpinned by an overwhelming scientific consensus over the need for urgent action and prioritisation in addressing climate change as a global existential threat to human societies (Ripple et al., 2019; Cohen, 2020; Gills and Morgan, 2020). Following a renewed understanding of the climate crisis' urgency raised in a special report published by the Intergovernmental Panel on Climate Change (IPCC) in 2018, and Greta Thunberg's climate advocacy that led to wide-spread school strikes and responses around the globe, heightened public awareness has arguably driven a large number of local governments globally to declare a climate emergency in 2019. While it has been long recognised that climate change as a global phenomenon requires actions 'at all levels of government and society' (Condon et al., 2009, 5), the recent popularity of a 'bottom-up, locality-centric approach' to addressing the climate emergency could be suggesting that local actors have realised the inadequacy or lack of robust response from actors at other levels (Gudde et al., 2021, 2).

What sets the climate emergency apart from conventional emergency situations is the lack of a single major shock that would stimulate immediate reaction, in which illustrating a 'long emergency' without provoking excessive psychological burden on societies can be challenging (Salamon, 2019). In response to such challenge, Salamon argues that climate emergency responses should rather emphasise on 'reason, focus, (and) dedication', which means entering an 'emergency mode' that centres upon prioritisation of the issue, allocation of resources, keeping in focus and an enhanced self-esteem through contributing towards a collective issue (page 7). An implication of this emergency mode of thinking to local governments is that their public declarations imply, to some extent, the need to reflect on their existing 'hierarchy of priorities', especially in 'policy and planning decisions' (Rode, 2019a, 4). They also signal a 'shift from "business as usual" climate management to a new emergency mode of climate governance' (Davidson et al., 2020, 2).

Considering the geography of climate governance, cities have long been identified as the key arenas for tackling the climate crisis (Betsill and Bulkeley, 2003; Reckien et al., 2018). This is partly due to an early realisation that 'impacts of climate change are experienced locally', in

which the 'geographic variability' in local experiences necessitates '"place-based" approaches' to effective response (Measham et al., 2011, 890). Cities also constitute 'part of both the problem and the solution" (Lindseth, 2004, 328, cited in Zanon and Verones, 2013, 343). This is because, while cities are directly and indirectly responsible for a significant amount of human activities-induced carbon emissions, they are also sites of innovation and growth, hence possessing both 'the responsibility and the opportunity' for promoting and mainstreaming low carbon transition in response to climate change (Newman, 2020). In this journey of transition, local governments can play a significant role by influencing 'decisions on urban form, primarily through urban planning and land use regulation' (Condon et al., 2009, 8). Planners as key facilitators of urban climate governance has also long been identified as mediators who 'manage and resolve conflicts' arising from potentially competing priorities across social, economic and environmental goals for sustainable development (Campbell, 1996, 305). In this sense, the cross-cutting nature of planning corresponds to that of the climate crisis, which impacts on an array of socio-economic functioning of cities.

Despite the demonstration of extensive support for the climate emergency agenda, Rode (2019) indicated that there remains a wide spectrum of follow-up actions taken by local governments as they demonstrate varying preferences in their choice of intervening mechanism. The huge variability in local governments' climate emergency response sparked my interest in exploring the extent and ways in which planning as a tool deployable by local governments can contribute to enhancing the capacities of local governments in addressing the climate emergency agenda. My interest corresponds to the growing academic interest in exploring 'urban planning for climate change', which is evident in the exponential increase in publications under this topic since 2010 (Jiang et al., 2017). A more recent study also advocated for the importance of urban planning policies to cities' response to the climate crisis (Hurlimann et al., 2021). In particular, Hurlimann et al. suggest that while urban planning can contribute to climate change mitigation and adaption through the control and management of development and activities on land, it can also be a contributing factor to the status quo of the climate crisis and 'path dependency'. These findings correspond to a recent publication by the UK's Climate Change Committee (2021), which suggests that, despite longstanding concerns over the inefficiency of the planning system under a neo-liberal narrative of growth, the planning system represents simultaneously a 'big obstacle' and a 'big potential' for delivering net zero locally. Such understanding reinforces the need to reflect on how

planning and climate objectives interact, and more importantly how can climate objectives be integrated into planning in a way that equip local actors and institutions with greater capacities to address the climate emergency agenda. This realisation has led me to the following research question:

How, and to what extent can local institutions build capacities to address the climate emergency agenda in an integrative manner through urban planning?

To fully answer this question, this research will be structured according to the following objectives:

1. Identify and outline the climate-planning nexus, more specifically how climate change and planning are conceptualised in the context of a climate emergency;
2. Demonstrate the ways in which local institutions' capacities to realise and optimise the climate-planning nexus can be understood through the lens of a governance-oriented framework of integration;
3. Explore how this framework can be utilised to evaluate the extent to which local institutions are capable of realising and optimising the climate-planning nexus through a case study city;
4. Identify the degree to which the nexus is realised through a case-wide audit of climate emergency strategies and action plans;
5. Evaluate the opportunities and impediments for local institutions to realise and optimise the nexus in the context of the climate emergency agenda through in-depth interview with forerunners;
6. Draw lessons from the case study city on ways in which local institutions can build capacities for addressing the climate emergency agenda through planning at stages of realisation and optimisation, and to evaluate on broader implications to the wider literature.

This research comprises of seven chapters. It will begin with an in-depth literature review on relevant key concepts, from which a theoretical framework is identified and established. This

will be followed by the methodology chapter, which explains and justifies for the approach taken as well as considerations for research ethics and positionality of the researcher. Findings and Analysis will be presented and discussed rigorously with reference to the wider literature, leading into a conclusion that identifies opportunities for future research.

2. Literature Review

Recognising the potential role of urban planning in both contributing and responding to the climate crisis, this chapter outlines a nexus approach undertaken by this research in order to identify cross-cutting aspects between these two increasingly connected disciplines. It also demonstrates that such conceptual framing, informed by an awareness of the possible implications of the climate emergency, is multi-disciplinary by nature, in which literature from different schools of thought is drawn to form a comprehensive and in-depth understanding of the topic. This is achieved by first identifying planning and climate-related literature, and particularly precedence of undertaking an integrative approach to understanding synergies between them. This initial exploration has led to further examination of governance and policy literature, which help to explore possibilities of realising and optimising the nexus.

2.1. The Climate Change and Urban Planning Nexus

To fully conceptualise the climate change-urban planning nexus, it is important to first understand how they have been understood in the wider literature. Planning is defined as 'a dynamic process where mainly land and infrastructure, but also other urban resources such as energy, water, waste and food, are managed' (Turcu and Gillie, 2020, 66). In this sense, one could argue that planning concerns both the built environment and resources that underpin the functioning of such environment. Such realisation echoes with Wilson and Piper's (2010) interpretation of planning as requiring a 'holistic understanding of the natural and environmental resources that underpin human societies', which forms the basis for 'integration and coordination of both the drivers and the outcomes' of policy sectors that correspond to these resources (page 10). The integrative effect of spatial planning is also recognised by Stead and Meijer (2009), in which integration is facilitated through establishing an 'overarching framework for sectoral policies' (page 329). The cross-cutting nature of planning correspond largely with the nature of the climate crisis, in which its sources and impacts also cut across multiple sectors and spaces (Harrison et al., 2016; Lundqvist, 2016). While historically, the international planning community had been focusing on tackling the challenge of greenhouse gas (GHG) emission reduction, more recent effort has broadened the scope of study to include planning for mitigation, adaptation and resilience (Meerow and Woodruff, 2020).

When considering urban planning for climate change, pursuing an integrative or nexus approach to conceptualising the relationship between the urban and the climate crisis is not new. Early study proposes the 'city-disasters' nexus by recognising impacts of the urban fabric on the different dimensions of climatic disasters and the ways in which urban planning mediates in between, in which 'integration of scientific knowledge with local policy decision-making' is key to effective response (Wamsler et al., 2013, 79). Besides recognising the need to integrate climate knowledge into the socio-political realm of policy, there has also been a rise of interest in the governance of climate change (Bulkeley, 2016). Bulkeley advocates for a 'critical' account of climate governance, which does not simply centre upon 'a set of actors and institutions' but also concerns 'specific modes of power through which governing is conducted and the processes and practices through which this takes place' (page 8). Such emphasis on processes and practices is realised in Turcu and Gillie's (2020) study, which connects governance with planning through a 'planning governance lens' (herein referred to as 'lens') with the aim of better understanding the 'governing process' of circular economy, an emerging form of sustainability and resilience planning. The lens consists of 'government', or the formal 'structure that upholds implementation', and 'governance', which refers to the 'lines of power (and knowledge construction)' that shape implementation (page 68-9). Based on these understanding, this research contends that the climate change-urban planning nexus (hererin referred to as 'nexus') is facilitated through a process-oriented approach to governance, which can be realised through the socio-political realm of policies and practices.

2.2. The Climate-Planning Nexus in Emergency Mode

When situating the nexus within the context of a climate emergency, it is important to note that, while climate change has been one of the key areas of study in planning literature, climate activism and emerging evidence published by global institutions in recent years have arguably given rise to the unprecedented scale of awareness and, to some extent, consensus over the need to address the climate crisis urgently. This means that this research is situated in the context of such recent major shift in narrative and potentially practices. The sense of urgency largely emerges from the realisation that, while 'adverse climate change is happening now… (,) emission levels are not falling', in which immediate thoughts and actions are much needed for tackling this crisis (Gills and Morgan, 2020, 895). In response to such realisation, an 'emergency turn' in climate governance could in effect result in, or in some cases intend to, creating 'states of exception' that

enable ‘mass mobilization of a jurisdiction’s full economic, social, and technical capacities to ward off an existential threat’ (Hulme, 2019, 23). However, the emergency narrative is not without its limitations. Hulme warns that, as the act of formally declaring a climate emergency conveys a sense of ‘absolutism’, the narrative of ‘doing whatever it takes’ to tackle the climate emergency may risk ‘diverting attention and resources’ from other equally concerning challenges, such as inequalities (page 23). This means that while the emergency mode recognises the need to prioritise climate issues, there remains the need to balance between climate-related and other important socio-economic objectives. In addition, Hulme’s critique of the ‘reductive logic’ that underpin the climate emergency discourse also indicates the difficulty to sustain a ‘quasi-permanent state of emergency’ in societies and the overemphasis on ‘carbon metrics’ that could obscure other non-carbon metrics which can be as important ‘for human well-being and ecological integrity’ (page 24).

2.3. Framing the Climate-Planning Nexus in Urban Climate Governance

Exploration of the nexus necessitates a more in-depth understanding of climate governance in an urban context. Urban climate governance (UCG) is understood as the intertwining of urban governance and climate change governance, characterised by an abundance of ‘experiments’ seeking for best practices that may involve ‘new stakeholder interactions, instruments and institutional arrangements’ (Wolfram et al., 2019, 2). While the proliferation and ‘exchange of best practices’ is seemingly reasonable as cities are facing some of the common challenges under the climate crisis, disproportionate interest given to experimentation, and the generalisation of knowledge from experiments, can risk the missed opportunity in converting ‘political ambitions embedded in these innovations into effective governance of urban sustainability transitions’ (Nagorny-Koring, 2019, 46). Nagorny-Koring therefore argued for the need to lend greater attention towards ‘experiential knowledge’ in UCG, including ‘personal experiences, (and) information about problems and barriers’ (page 55). This research will contribute to this aspect by harnessing practical experiences of planners and climate actors in utilising and potentially integrating emerging knowledge and evidence into planning for climate emergency response.

In addition, UCG literature also has a focus on multilevel governance. While governance is conceptualised as ‘sustaining coordination and coherence among a wide variety of actors with different interests and objectives’ (Marquardt, 2017, 169), multilevel climate governance can be

seen as the 'multiple decision-making processes' involved in the 'process of…planning within coordinated spatial policy frameworks' (Kim et al., 2020, 77-8). Kim et al. suggest that such an approach can enable one to better understand the importance of 'planning, policy and institutional capacity' (page 77) in addressing climate change. Besides, it is also argued that establishing integrated strategies 'across physical scales, jurisdictions, and electoral timeframes' is key to effective planning for climate change (Raven et al., 2018, 140). This means that one needs to consider the implications of decisions made at one level of government to another level, such as regional to local and vice versa, and at the present to the future. However, although multilevel climate governance, characterised by 'the dispersion of governance across multiple jurisdictions', can help to capture territorial variations in the 'reach of policy externalities' (Marks and Hooghe, 2004, cited in Marquardt, 2017, 168), Marquardt emphasises on the importance of seeking balance between dispersion and centralisation of governance, as over-dispersion could lead to fragmentation and weakening of the decision-making process. Nevertheless, this research believes that the nexus is built upon the different processes through which UCG is constructed upon.

2.4. Realising and Optimising the Climate-Planning Nexus: A Governance-oriented Framework

Such understanding leads to the exploration of a governance-oriented approach to understanding integration, in which an integration framework proposed by Cumiskey et al. (2019) (herein referred to as 'framework') is found to fit this purpose. Integration is significant as it can potentially serve as a solution to one of the key challenges to climate governance in cities, which is their 'incremental and fragmented…policy responses' (Romero-Lankao et al., 2018, 586). The framework enables an assessment of 'the overall degree of integration' across key elements of governance while providing indicators for determining 'the strength of a specific element' (page 25). By categorising the different elements into 'governance capacity' and 'realisation of integration' (Figure 1), it has the potential to serve as a starting point for, as Bulkeley (2016) recommended, a relatively more critical account of climate governance. While the framework was initially developed in the context of flood risk assessment, considering that flood risk constitutes part of the wider climate emergency challenge, this research intends to take an experimentative approach by adapting the framework to the nexus challenge. By seeing the nexus as an integration challenge, this research seeks to explore how, and to what extent can local actors and institutions,

such as planners and local governments, be capable of realising and potentially optimising the nexus.

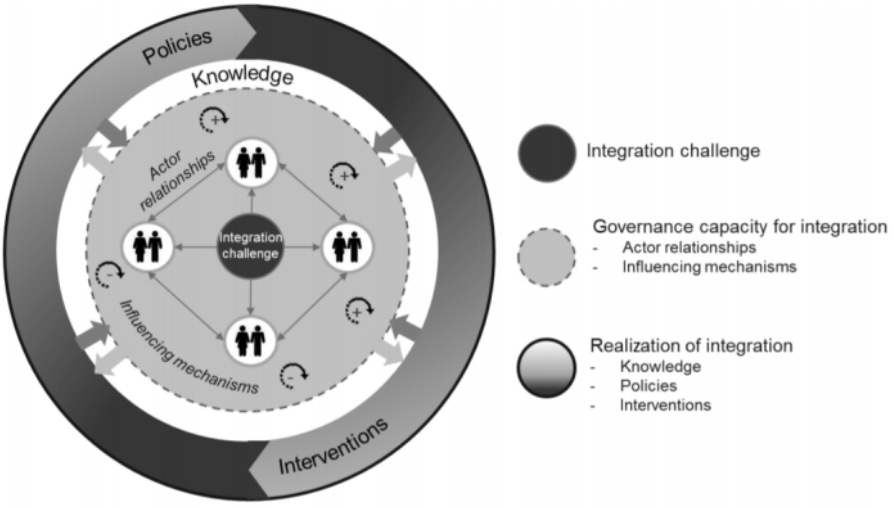

Figure 1. A framework for understanding interconnectivity between 'interconnectivity between the dimensions and elements of integration' (Cumiskey et al., 2019, 17)

2.4.1. Governance Capacity for Realising and Optimising the Climate-Planning Nexus in State of Emergency

While the framework has determined 'actor relationship' and 'influencing mechanism' as key elements that facilitate governance capacity for integration, it is useful to gain a broader understanding of how these two elements are perceived in the wider literature in order to determine how this research can better adapt the framework to the nexus. Governance capacity has been referred to, in the context of multilevel climate governance, as the degree to which 'agents can or cannot mobilize their power resources' to influence particular outcomes (Marquardt, 2017, 169-70). When applied to the nexus, it can be understood as the degree to which agents are able to mobilise relevant resources to achieve sustained coordination of objectives between UCG and planning. Marquardt also identifies three types of governance capacity, which include 'personnel', 'information' and 'financial' capacities. Such categorisation echoes largely with the conceptualisation of climate governance capacity as consisting of context-specific 'human resources, financial resources, legal frameworks, and legitimate institutions' (Romero-Lankao et al., 2018, 586). The ways in which capacities are categorised in both studies correspond greatly

with Cumiskey et al.'s (2019) conception of actor-, rule- and resource-based 'influencing mechanisms' (page 21), in which information-based capacities will be added to the trio in this research.

More specifically, while Koop et al. (2017) agree with Romero-Lankao et al. on the importance of considering the specific context within which governance capacity is understood, they also argue that actors in particular play a crucial role in building governance capacity, or 'enabling effective change' (page 3430), by identifying and jointly acting on collective challenges. It has also been argued that UCG involves the 'act of goal-setting', which signifies, to some extent, a sense of 'constructive discontent with present performance' that can potentially drive greater efforts or changes to the current approach in order 'to secure a given outcome' (Hofstad et al., 2021, 2). Based on these understanding, it is important for this research to identify the key actors who have participated in goal-setting for UCG and planning, and interactions between actors during this process that may have contributed to facilitating realisation and optimisation of the nexus. This research also assumes that the act of goal-setting is an indication of attempt to jointly identify and act upon the challenge of the climate emergency, in which the extent to which actors are able to achieve or facilitate the achievement of goals depend on their governance capacity.

2.4.1.1. Significance of Local Institutions

While it is recognised that multilevel governance is a key feature of the nexus, particular attention is placed on local institutions, which is understood as local governments and will be used interchangeably throughout this research. While this is partly because this research is situated in the context of local governments' declaration of a climate emergency, their significance in responding to the climate crisis has long been recognised due to their close contact with local stakeholders and their 'transformative potential' through decision-making in relation to 'spatial planning' and other aspects of the environment (Hoppe et al., 2014, 2). In addition, the local scale is significant because it has been seen as an 'optimal site for (public) policy experimentation' where innovations can be 'tested on a smaller scale and then replicated in other communities' (Vogel and Henstra, 2015, 111). In this sense, the local has the potential to serve as an arena for policy innovation and experimentation, which is key to UCG as discussed above. In relation to the nexus, actors situated within local institutions can have important implications to such innovative process and learning, particularly through the use of their expertise and knowledge in the field of

climate change and planning. Early concerns for uneven concentration of 'climate change expertise…in environmental departments' in local governments recognise the importance of institutional allocation of expertise in facilitating 'cross-sectoral coordination within the organizational hierarchy', which is key to effective climate governance (Kern et al., 2008, cited in Romero-Lankao et al., 2018, 596). As planners are seen to be the key actors to 'manage and resolve conflicts' arising from the triangle of social, economic and environmental goals for sustainable development (Campbell, 1996, 305), one could argue that they encompass the potential to facilitate connection and integration between climate and non-climate expertise in relation to the built and natural environment.

2.4.1.2. Influencing Mechanisms of Institutional Actors

Interactions between actors with different expertise is a key influencing mechanism for actors to enact change. A sociological institutionalist approach is considered for analysing actor-based governance capacity, which emphasises on 'interactions' between actors within their 'action space' or specific context underpinned by 'institutional norms, rules and practices' (González and Healey, 2005, 2058). In this sense, the extent to which interactions are encouraged and enabled between diverse institutional actors may depend on the institutional context within which they are situated. Apart from interactions, it is recognised that instruments available to planners in particular can include 'statutory control over the development of land', which is often more effective in preventing undesirable form of development, influence over development-related decision-making through 'persuasion' and direct allocation of public funds in some cases (Bracken, 2014, 31). Yet, the extent to which such climate considerations are integrated into these instruments and that they are available may depend on the nature of the planning system as well as wider context within which planners and other relevant actors are situated within. Realising and Optimising the Climate-Planning Nexus

2.4.1.3. Coproduction of Knowledge

Knowledge plays a key role in aligning understanding of collective issues. In particular, capacity for effective climate governance depends on the 'availability, transmission, and use of information' by relevant actors, as it helps to enable informed decision-making (Romero-Lankao et al., 2018, 598). Romero-Lankao et al. emphasise on the ways in which coproduction of relevant information can encourage stakeholder engagement while enhancing awareness and 'usability of

the information' (page 598). In particular, enhancement of usability could be due to a principle of coproduction that 'users are regarded as active agents and not merely passive subjects' (Heaton and Britten, 2015, 3), in which users are more aware of the structure and details of coproduced information. However, one should be aware that the collection, representation and use of information can be political in the sense that they could 'reflect the broader priorities of decision-makers' (Hughes and Romero-Lankao, 2014, cited in Romero-Lankao et al., 2018, 598). Nevertheless, the benefits of coproducing knowledge have been recognised as beneficial in many ways, including the opportunity to incorporate 'different expertise and experiences to evidence generation and policy development' (Tangcharoensathien et al., 2021, 2). This corresponds to the multidisciplinary nature of the nexus and can potentially facilitate the optimisation of the nexus by connecting climate- and planning-related expertise in the socio-political realm of policy.

2.4.1.4. Integrated Policies and Plans

Integrated policy as potential site for realising the nexus can be seen as a product of policy integration, a form of interaction between different policy domains. It constitutes part of a spectrum of policy interactions, which can be conceptualised into three main categories including cooperation, coordination and integration (Figure 2). While coordination aims to establish 'mutually enforcing and consistent' sectoral policies, integration focuses on 'cross-cutting objectives' and may involve producing 'one joint policy for the sectors involved' (Stead and Meijer, 2009, 322). Hence, as Figure 1 demonstrates, intensity of interaction and interdependence between policy domains are the highest for integration. Advocacy for policy integration dates back to the 1992 Rio Declaration, which encourages policy-making that goes 'beyond sectoral approaches' (Commission of the European Communities, 1990, 1, cited in Rode, 2019b, 40). More recently, the United Nation Sustainable Development Goal 11.3 and 11.b also support the adoption of 'integrated and sustainable human settlement planning' and implementation of 'integrated policies and plans' (UN, 2015, Goals 11.3 and 11.b, cited in Rode, 2019b, 40). Recent literature review on policy integration and coordination studies also recognised increasing academic interests in exploring 'cross-sectoral responses to complex problems', including environmental issues (Trein et al., 2020, 1). While policy integration may come in different forms, a governance-oriented approach to policy integration would require policy-making in one or more domains to consider policy objectives of other domains (Giessen, 2011a and 2011b, cited in Tosun and Lang, 2017). Tosun and Lang suggested that policy integration may take form through identifying

'interdependencies…between policy domains' (page 555) and employing 'specific policy instruments' that facilitate integration, emphasising on how integration can be achieved through procedural mechanism.

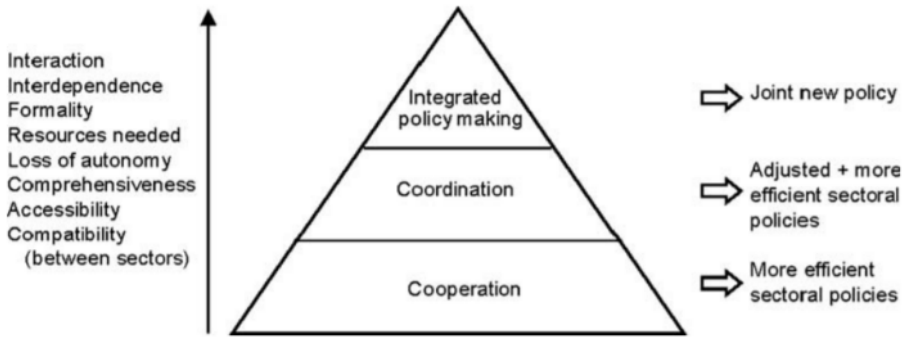

Figure 2. Three modes of policy interaction (Stead and Meijer, 2009)

Key forms of policy integration include vertical integration of 'different levels of government' and horizontal integration of 'policy domains, within the same level of government or the same organisation' (Holden, 2012, cited in Lowe et al., 2018, 181). Planning plays a critical role in facilitating and enhancing policy integration. Example of planning-related 'integration instruments' for facilitating policy integration include integrated plans for coordinating different policy domains, environmental impact assessment, strategic environmental assessment and sustainability appraisal (Stead and Meijer, 2009; Rode, 2019b). Raven et al. also recognised increasing consensus over the need to integrate 'urban planning and urban design, climate science, and policy' in order to establish effective response to climate change that ensures 'high quality of life' while capturing 'climate change benefits' in urban areas (page 140). In addition, while it is recognised that integration between different policy domains is key to sustainable development, the degree to which it can be achieved can sometimes be undermined by the lack of 'vertical coordination between levels of government' and 'functional fragmentation' (Vogel and Henstra, 2015, 116).

3. Methodology

This chapter begins with outlining a case study research approach and justification for its appropriateness to the research topic, followed by details narrowing down the focus from a strategic case to unit selection. The subsequent section demonstrates the qualitative nature of this research, with explanations on the use of text data as well as the data collection process and a mixed approach deployed for rigorous analysis. The final section reflects on the implications of the researcher's positionality and research ethics.

3.1. Embedded Single Case Study

Recognising the importance of situated, experiential knowledge in understanding UCG and potentially the nexus, this research undertakes a case study approach with particular emphasis on practitioners' experiences. The case study is chosen as it enables the researcher to understand a 'larger class of units' through 'intensive study of a single unit', in which this research deploys an understanding of a unit as 'a spatially bounded phenomenon…observed at a single point in time or over some delimited period of time' (Gerring, 2004, 342). It is also recognised that one should select a case study design that is appropriate to the research question since the choice of design will have implications to the ways in which the case relates to the wider context (Yin, 2012). In this case, an embedded single case study approach is deployed (Figure 3), in which the primary aim is not to compare and contrast units but rather to explore how the nexus can be realised and optimised by local institutions operating within the studied case and context. The reason for pursuing such an approach is because the climate emergency as an emerging phenomenon may continue to develop rapidly and differently under varying contexts, in which maintaining an exploratory nature can ensure flexibility in terms of capturing emerging trends. While this research has a focus on situated knowledge, 'strategic selection of cases' is pursued to enhance the 'generalizability of case studies' (Flyvbjerg, 2006, 229). In particular, this research adopts an 'information-oriented selection' strategy for case selection, accompanied by 'stratified sample' selection to identify specific geographical units for more in-depth study in order to capture local variations and commonalities in realising and optimising the nexus within a single case (Table 1).

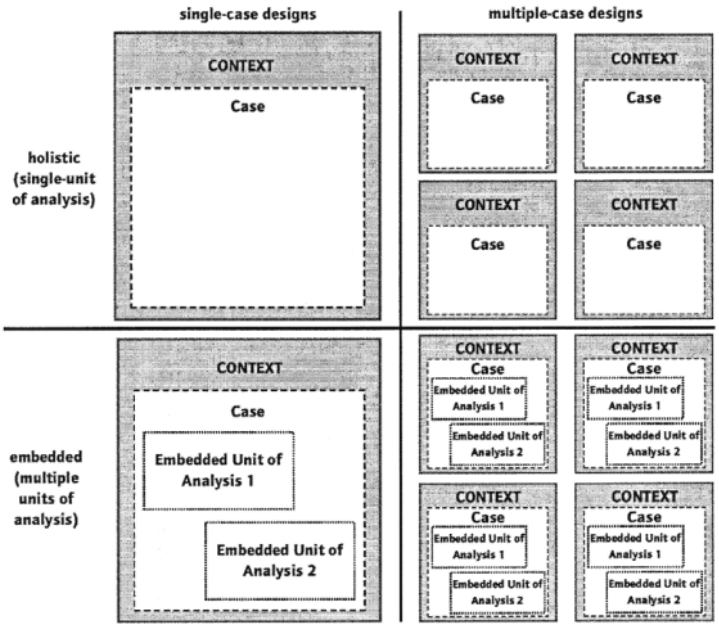

Figure 3. Illustrating types of case study design (Yin, 2012)

Table 1. Sample and case selection strategies by type and purpose (Flyvbjerg, 2006, 230)

Type of Selection	Purpose
A. Random selection	To avoid systematic biases in the sample. The sample's size is decisive for generalization.
1. Random sample	To achieve a representative sample that allows for generalization for the entire population.
2. Stratified sample	To generalize for specially selected subgroups within the population.
B. Information-oriented selection	To maximize the utility of information from small samples and single cases. Cases are selected on the basis of expectations about their information content.
1. Extreme/deviant cases	To obtain information on unusual cases, which can be especially problematic or especially good in a more closely defined sense.
2. Maximum variation cases	To obtain information about the significance of various circumstances for case process and outcome (e.g., three to four cases that are very different on one dimension: size, form of organization, location, budget).
3. Critical cases	To achieve information that permits logical deductions of the type, "If this is (not) valid for this case, then it applies to all (no) cases."
4. Paradigmatic cases	To develop a metaphor or establish a school for the domain that the case concerns.

3.1.1. Case Selection: London

The single case chosen in this research is London. One of the reasons for choosing this city is because London has always been at the forefront of municipal climate governance globally. As the 'founding city' of the transnational C40 network, and a member of the European steering committees of the network, London has the ability to socialize and collaborate with other networked cities on tackling climate challenge (Mayor of London, 2016; Lee, 2019). This indicates London's influence in leading on the climate emergency agenda at the global arena. Besides, the national context within which London operates is also highly in favour of leading on the agenda, particularly in relation to climate change mitigation. More specifically, the national statutory climate target requires that by 2050, the total amount of greenhouse gas (GHG) emissions produced by the UK will have to 'be equal to or less than the emissions the UK removed from the environment' (ONS, 2019). These factors combined have made London a potentially interesting case for studying the climate emergency agenda as an emerging trend and planning.

3.1.2. Case Context and Unit Selection: Planning and the Climate Emergency in London

To better understand how the nexus is situated in London and identify appropriate analysis unit for this case, one needs to be aware of its governance structure in relation to planning as well as recent shifts in the climate agenda across different levels of government. As demonstrated in Figure 4, planning is governed by two tiers of government in London, the Greater London Authority (GLA) and local planning authorities (LPAs) with the exception of the City of London Corporation (Turcu and Gillie, 2020). For the purpose of sample control, this research uses the 32 London Boroughs (LBs) within GLA boundary as analysis units, which are identified as potential analysis unit for this case study. Besides, due to the multi-disciplinary nature of the topic, this research intends to look beyond LPAs in terms of local institutions into local authorities (LAs) especially in relation to climate-related work. A scoping strategy is deployed to narrow down selection of units for more in-depth analysis, which will be further elaborated in the following chapter. To better capture the multilevel governance structure of the case, London is referred to in this research as the 'regional' while LBs constitute the 'local'. Any interaction between multiple but not all, most likely neighbouring, LBs is considered as 'sub-regional'.

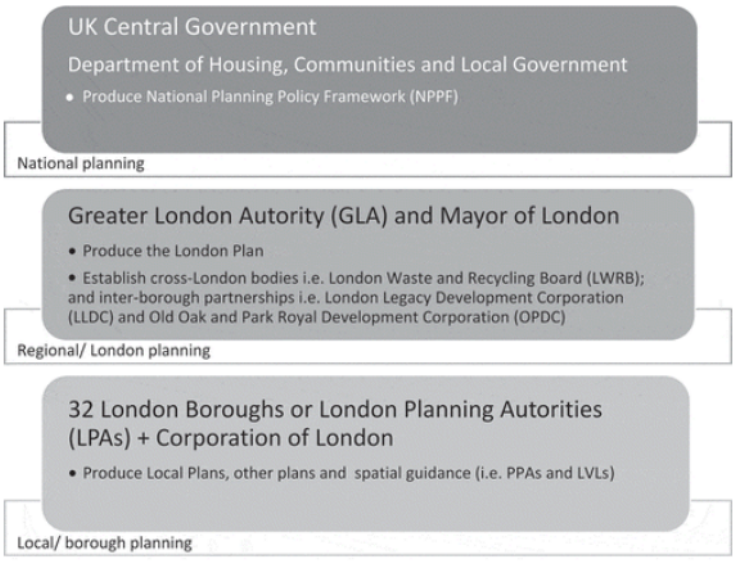

Figure 4. London's planning governance (Turcu and Gillie, 2020, 70)

Besides, political will for tackling the climate crisis is evident in both regional and local governments. For instance, the GLA declares a climate emergency in 2018, followed by the publication of the Mayor's *Zero Carbon London: A 1.5°C compatible plan*, presenting a roadmap of key actions needed for London to become a 'zero carbon city' (Taylor, 2018; Mayor of London, 2018). At the local level, declaration of a climate emergency by 28 LBs (Figure 5), with varying targets, arguably indicates a general consensus over the urgent need to tackle to the climate crisis. In terms of relationship between planning and climate change, it has been recognised that planning serves as one of local governments' levers, 'place shaping', for influencing local GHG emissions (Figure 6). However, the degree to which such lever can be mobilised to deliver net zero target through planning may also be constrained by various factors, including 'the method of calculating housing targets and viability rules' (Marix Evans, 2020, 33). This corresponds to Hurlimann et al.'s (2021) argument that urban planning can simultaneously offer opportunity for tackling and be part of the problem that has led to the status quo of the climate crisis, in which this research seeks to further explore through the lens of the nexus.

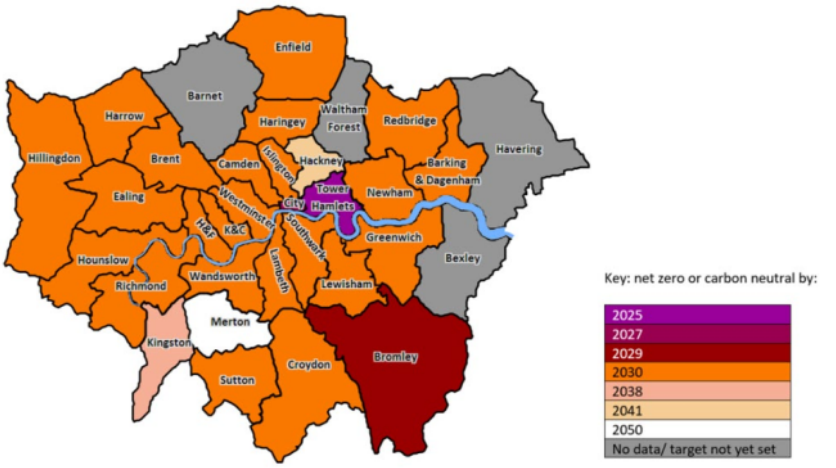

Figure 5. Variation in stages of climate emergency declaration (London Councils, n.d.)

Figure 6. Levers and influence of LAs in response to the climate emergency (centre for sustainable energy, 2020)

3.2. Qualitative Research: Texts as Data

This research follows a qualitative approach, using texts from both documents and dialogues as data. The reason for integrating the two sources is that, while the advantage of documents includes their accessibility and 'broad coverage' (Bowen, 2009, 31), they can sometimes lack details necessary for fully understanding the research topic. Dialogues in this case could help to fill in gaps, in which texts from semi-structured interviews with relevant actors are used in a complementary way to ensure that the level of breadth and depth of data collected is adequate for fully addressing the research question. In relation to determining data volume, this research embraces the social constructionist tradition, discussed by Malterud (2012), which deems knowledge as 'partial, intermediate, and dependent of the situated view of the researcher' (page 801). In this sense, the sample size should be determined by the degree to which it is 'sufficiently large and varied' to answer the research question (Malterud et al., 2016, 1753). Considering the relationship between sample size and information power (Figure 7), since this research follows a single case study approach with particular focus on local institutions, a relatively small N with high information power is deployed. Applying such understanding to the aforementioned 'stratified sample' selection strategy, 'in-depth analysis of narratives or discourse details from a few, selected participants' (Malterud et al., 2016, 1756) across multiple stratified samples is conducted to enrich insights drawn from key documents, which covers units within the case more extensively.

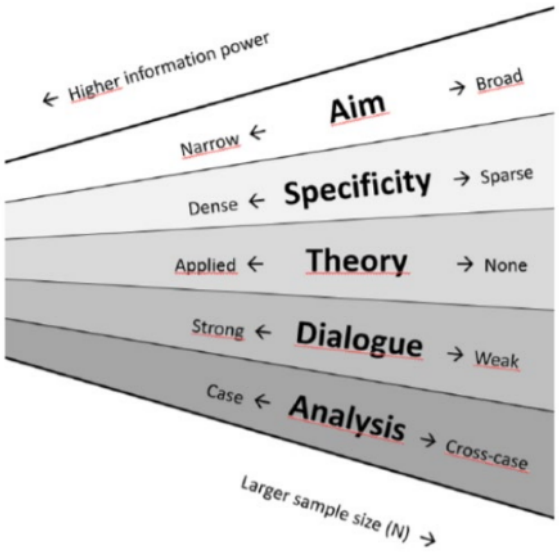

Figure 7. Relationship between information power and sample size (Malterud et al., 2016)

3.3. Data Collection and Analysis

3.3.1. Exploratory Document Analysis: Signs of Realising the Nexus

In order to identify evidence of formal recognition and potential realisation of the nexus, this research undertakes qualitative content analysis (QCA) to examine climate emergency strategy and/or action plan (Strategy), either in draft form or fully adopted, published by LAs from any of the 32 LBs identified above. Since the Strategies are analysed in an exploratory for establishing initial understanding, this research does not intend to separate adopted and draft Strategies at this stage. Besides, attention is given to the portrayal of the climate emergency agenda in the Strategies as literature suggests that the representation of information may be reflecting wider political priorities, which could have implications to the subsequent choice of planning instruments. Through QCA, or thematic analysis, this research utilises 'codes and categories' to identify themes from texts (Kuckartz, 2019, 182). As Kuckartz also suggests that the formation of categories can be 'concept-driven' or 'data-driven', or a mix of both, for the purpose of exploring the value of the framework, 'concept-driven' categories adapted from the framework are used to enable systematic review of key documents, in which findings will be presented in a matrix table. This is coupled with identifying planning-related tools and instruments across Strategies, also demonstrated in a matrix, as this may generate insights into how planning is addressed in climate-

focused strategic documents. Note that *any table or figure without a specified source is the author's own representation*.

3.3.2. Social Network Analysis and Qualitative Interpretation of Interviews: Assessing Capacities for Realising and Optimising the Nexus

To further explore the processes through which the Strategies were produced and to capture experiential knowledge in relation to the opportunities and challenges in realising and optimising the nexus, semi-structured interviews are conducted with key actors, including key contributor(s) who participated in coordinating work around the Strategies and planners. Semi-structured interview is deployed as it provides 'a setting/atmosphere where the interviewer and interviewees can discuss the topic in detail' (Srivastava and Thomson, 2009, 75), which is appropriate in this case as more depth is needed to complement the extensiveness of the exploratory document analysis. An initial strategy for reaching potential interviewees was deployed at earlier stage of the research, which involves contacting LPAs across London with an expectation of reaching other relevant actors through a snowballing effect. However, as this has not been particularly successful, possibly because climate change expertise does not necessarily sit within the planning department based on the researcher's own evaluation, an alternative strategy was adopted by contacting all LBs that have adopted or published a draft Strategy, where relevant contact details can be identified. The renewed strategy was proven to be relatively more effective. Regarding interview questions, since the aim is to learn about how participants perceive 'what they have…experienced' (Rubin and Rubin, 2005, cited in Owen, 2014, 8), open-ended questions that correspond to themes adapted from the framework are designed to give interviewees adequate space for sharing their first-person experiences while maintaining certain degree of structure and consistency across interviews. As Rubin and Rubin also suggest that including basic information about the interviewees can help to present them 'as real people rather than abstractions' (cited in Owen, 2014, 8), details of anonymised interviewees' profile, including roles and responsibilities and their significance, will be presented in the following chapter to better demonstrate the context from which they are speaking from.

Regarding data analysis, Incorporation of findings from interviews begins with social network analysis (SNA), which enables better understanding of 'what facilitates or impedes' flows between actors' through approximating 'structure of relationships' (Serrat, 2017, 40). While SNA

arguably simplifies relationships into 2-dimensional networks (Figure 8), which in reality is likely to be multidimensional (Scott, 1988), it is nonetheless a useful tool for exploring structures of relationship in relation to governance capacity conceptualised under the framework. The extent to which actors are able to influence and enact changes in realising the nexus, and mechanisms available for them to do so, are also examined. Following SNA, an interpretive exercise is carried out to further unpack context-specific details and identify emerging themes from interviews. A mix approach to coding is deployed, beginning with 'concept-driven' categories informed by the framework, followed by 'data-driven' open coding to maintain some degree of flexibility for capturing emerging trends from the data. Note that the nature of this approach is mainly interpretive in the sense that findings and analysis are subject to the researcher's interpretation of the data through an iterative process of reduction and clustering inspired by Hycner's (1985) approach. While this means that the findings may, to great extent, be limited by the researcher's understanding, interests and experiences in relation to the research topic, such an approach remains valuable in an exploratory sense given the evolving context within which this topic is situated.

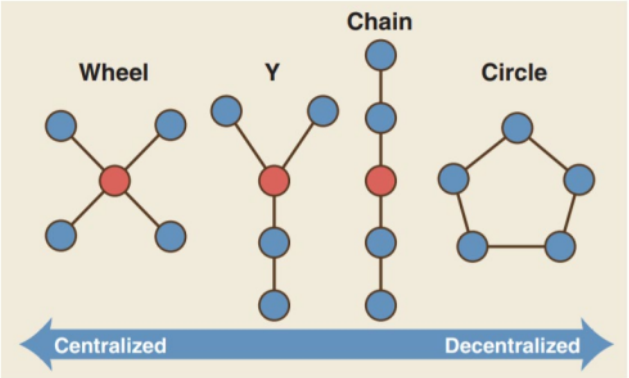

Figure 8. Examples of network structure and their degree of centralisation/decentralisation (Borgatti et al., 2009, 893)

In terms of integrating analysis of both documents and interviews, gaps in findings from the exploratory document analysis inform mostly the restructuring of categories for open-coding (Figure 9). Throughout the process, NVivo, a Qualitative Data Analysis Software (QDAS), is used to assist with the process of coding as it provides 'a set of tools' for managing qualitative data that enables more effective and efficient learning (Bazeley and Jackson, 2013, 2). While Owen (2014)

has identified critiques associated with over-mechanisation and homogenisation of the analysis process through the use of QDAS, this research can benefit from it as its functionality enables one 'to switch between…closeness for familiarity and appreciation for subtle differences, but distance for abstraction and synthesis' of the data (Bazeley, 2007, cited in Owen, 2014, 14). Therefore, it is used this research as a supporting tool for gaining better understanding and identifying key themes from text data.

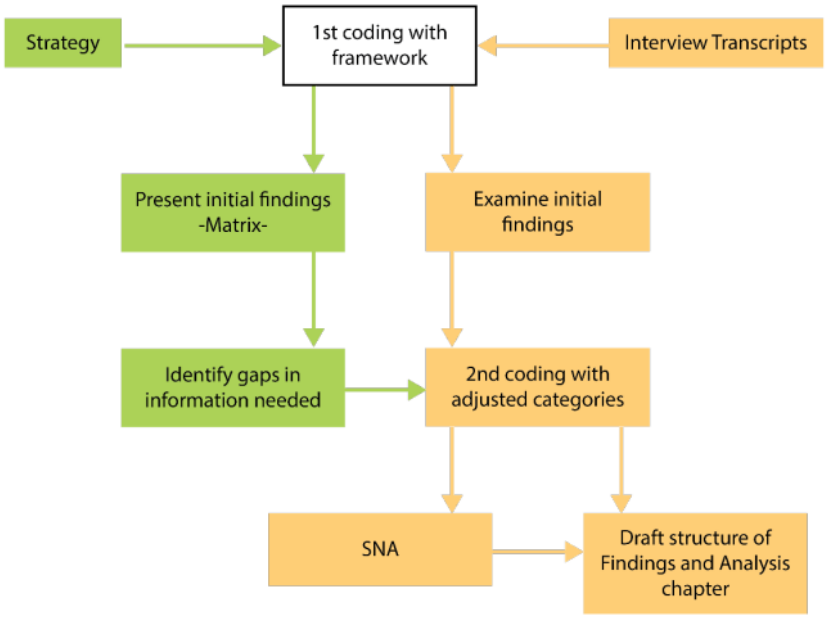

Figure 9. Flow chart demonstrating how the two types of data are processed and integrated

3.4. Positionality and Research Ethics

A key consideration for evaluating research ethics is the extent to which 'values and moral principles are integrated in the actions and reflections of research' (Stige et al., 2009, 1511). In this sense, it is important to consider the positionality of the researcher. Firstly, while the researcher is fully aware of the importance of public participation in tackling the climate crisis, it is also recognised that the researcher carries particular interest in the role of formal public institutions and there is no intension to disentangle such interest from this research. The main reason for adopting an institutionalist focus is because the climate emergency movement, as an emerging and rapidly

evolving phenomenon, is arguably still in its early stage of development in terms of its interactions with planning. At this stage, there are clear benefits and the need for local institutions to steer and coordinate climate actions, especially through using their planning powers, which this research seeks to contribute towards. In addition, regarding the recruitment of interviewees, although some of them are working at the workplace where the researcher is undertaking a placement at, the placement was agreed on before interview invitations were sent off. Hence, there is no association between the recruitment process and the placement and that there is no known conflict of interest.

To ensure transparency of the data collection process and that interviewees are aware of their corresponding rights, an information sheet and a consent form were sent to each interviewee before the interview took place, in which they were asked to read through and raise questions if there are any. These documents briefly explain the intent of the research, point of contact in case of query and complain, how data is stored and managed in a way that ensures confidentiality, and option for interviewees to opt out if they intend to within a limited period of time after the interview takes place. Due to abnormal circumstances of the pandemic, interviewees were offered two ways to complete the consent form, either by scanning and returning the form through email or, if they agree to be recorded, give verbal consent at the beginning of the interview. Besides, as indicated in the consent form, recordings of interviews are used for transcription and are disposed at most one month after transcription. Consent regarding anonymity is also included because as the researcher intends to collect information about interviewees' roles and responsibilities, as recommended in the literature. Majority of interviewees have agreed for their role and affiliation to be used in connection with their speech or information that they provided, which is beneficial to this research as it enables a more contextualised analysis of text data extracted from dialogues. Where there is the possibility of implicit association between the interviewee and the borough, efforts are made to anonymise the interviewee by referring to the interviewee without stating the number.

4. Scoping Strategy

To further elaborate on how this research narrows down its unit selection, this chapter will briefly demonstrate the scoping strategy deployed to strategically determine the selection of analysis units. It begins with identifying the progress of each LB in addressing the climate emergency, in which phases of progress range from formal adoption/draft to the absence of declaration (Figure 10). It is evident that while a small number of outer London boroughs are yet to declare a climate emergency, the rate of response across London, and sub-regions in particular, is spatially uneven. In particular, boroughs that have either adopted or are reviewing a draft Strategy (green) largely concentrate in West London, with some clusters in other sub-regions. As the adoption or publication of a draft Strategy is seen as an initial response to the climate emergency following public declaration and therefore a potential site for realising the nexus, boroughs that fall within the 'green' category, viewed as 'forerunners' in this research, constitute the first layer of analysis units, in which their Strategies form the source of data for the exploratory document analysis (Table 2).

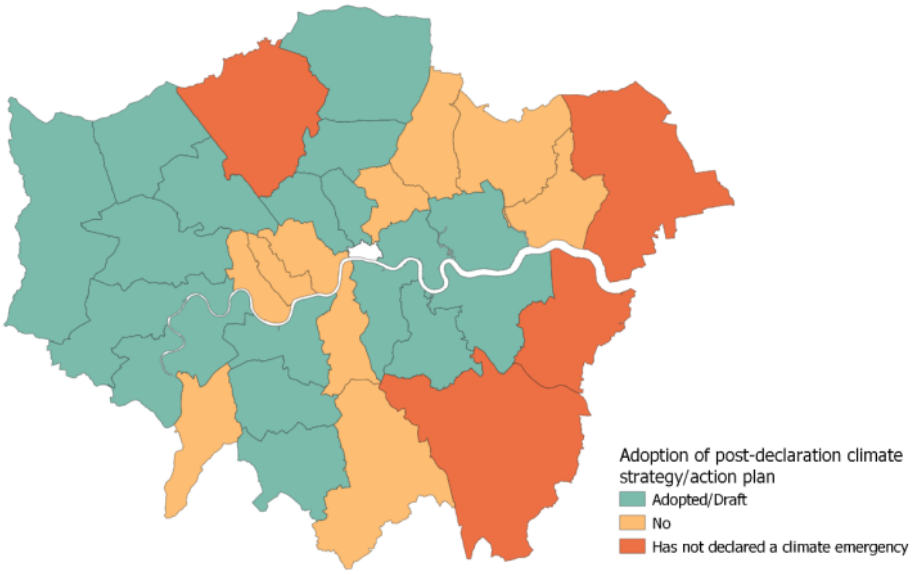

Figure 10. Progress of adopting a climate emergency strategy and/or action plan after declaring a climate emergency by London borough up until 6 April 2021

Table 2. List of documents collated for exploratory document analysis

Document title
1. The Climate and Ecological Emergency – Harrow's Interim Strategy and Actions
2. An environmentally friendly borough Wandsworth Environment and Sustainability Strategy 2019 -2030
3. Brent Climate & Ecological Emergency Strategy 2021-2030
4. Camden Climate Action Plan 2020-2025
5. Carbon Neutral Plan 2021-2030 (Greenwich)
6. Climate and Ecological Emergency Strategy (Ealing)
7. Climate Emergency Action Plan (Hounslow)
8. Climate Emergency Action Plan (Newham)
9. Climate Emergency Strategy 2020-2024 (Richmond)
10. Enfield Climate Action Plan 2020
11. Haringey Climate Change Action Plan
12. Lewisham Climate Emergency Strategic Action Plan 2020-2030
13. Merton Climate Strategy and Action Plan
14. Net Zero Carbon Plan (Tower Hamlets)
15. Sutton's Environment Strategy 2019-2025 & Climate Emergency Response Plan
16. Tackling the Climate Emergency Together Southwark's strategy to become Carbon Neutral by 2030
17. Vision 2030: Creating a Net Zero Carbon Islington by 2030
18. London Borough of Hillingdon The Strategic Climate Action Plan Draft for Consultation March 2021

Furthermore, following the aforementioned strategy for reaching interviewees, key actors from LAs that fall within the 'green' category are invited for an in-depth interview. In most cases, the first point of contact is one of the key contributors of writing up the Strategy, named as 'Strategy Coordinator' (SC) to give some context about the speaker in the subsequent analysis. The same principle is applied to other interviewees where appropriate. More broadly, details of interviewee profile, including their roles/expertise and significance to this research, are included

below to illustrate the context from which different interviewees are speaking from (Table 3). While primary interviewees constitute a focus in this research, valuable insights drawn from other interviewees' responses have largely informed the development of this research. Besides, the aforementioned sub-regional variations in adoption progress have led to an attempt to reach sampled boroughs locating in different sub-regions, which has arguably been successful as SCs situated in eight LBs that are reasonably dispersed across the city have kindly accepted the invitation (Figure 11). Note that although dialogues are closely connected to local institutional context, interviewees are speaking from a professional perspective, which do not represent the corporate views of the LAs.

Table 3. Overview of interviewee profile

Interviewee	**Roles and/or Expertise**		**Significance**
Primary (Actors within LAs)			
SC 1	Climate Change/Carbon reduction	• Economic Growth • Energy	• Key contributor to the Strategy (one SC **worked across two LBs** under shared staffing arrangement); • Worked closely with planning colleagues on work in relation to planning policy and development management.
SC 2		• Policy	
SC 3		• Energy • Review planning applications in relation to climate change policies • Work closely with a colleague who writes climate change policies for the Local Plan	
SC 4		• Energy • Past experience in environmental impact assessment	

SC 5		• Energy (Fuel poverty advice service, energy strategies) • Flood-related functions	
SC 6		• Transport	
Policy Planner (PP) 7	Currently focuses on planning policy, used to have a focus on environmental policy (energy, waste, open space, flood) in the past. Have past experience in development management.		Close working relationship with the SC
PP 8	Plan-making and planning policy		
Development Management and Policy Planner (DMPP) 9	Development management and planning policy		
Interviewee 10 (written response)	Anonymised		Good understanding of the climate emergency
Informed			
Energy Consultant (EC) 11	Monitoring renewable energy unit, reviewing energy strategy		Past experience working in LA (climate change and energy)
Interviewee 12	Anonymised		Understanding of London Councils' climate change program
Interviewee 13	Local resilience		Engaged with consultation for a LB's Strategy
Interviewee 14	Transport		

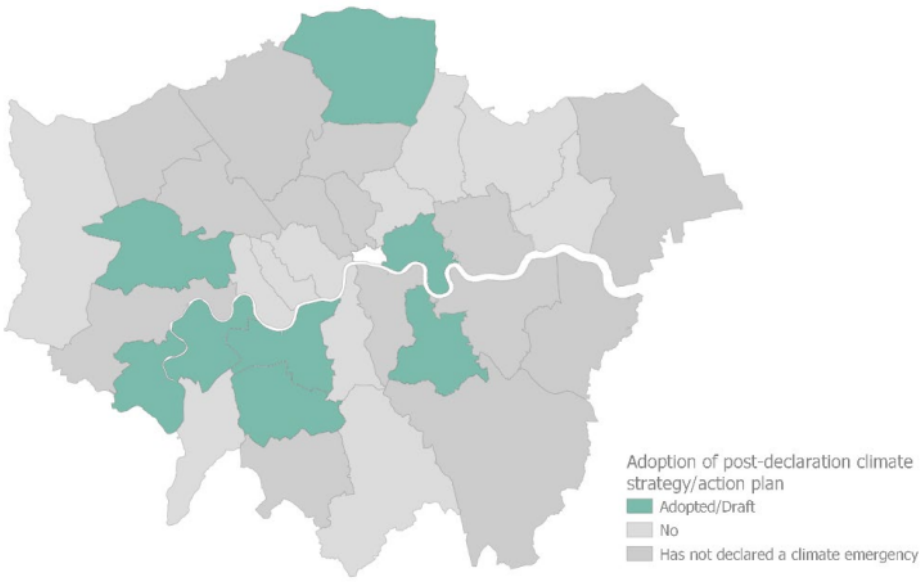

Figure 11. Analysis units – Sampled boroughs (in green) reached for semi-structured interviews with key contributors of the Strategy

5. Findings and Analysis

This chapter will present and integrate findings from the exploratory content analysis of the Strategies and interviews, structured in three main sections. The first two sections follow a chronological order, transitioning from realisation, an overview of the Strategy and its preparation process, to optimisation, the use of planning instruments and beyond, of the nexus. Opportunities and barriers in relation to LAs' capacities for realising and optimising the nexus will be evaluated, followed by a summary of participants' perceptions on the implications of the climate emergency to such realisation and optimisation.

5.1. Realising the Nexus: The Climate Emergency Strategy

Majority of the Strategies follow a thematic structure, in which an overview of the status quo of the LAs' and borough-wide emissions is followed by justification for and details of climate actions categorised under each thematic chapter. All Strategies share a number of common themes, including but not limited to energy, transport/travel, waste, and natural environment (for table see Appendix). The common themes are largely relevant to planning in a broader sense, conceptualised by this research with reference to existing literature as management of the built environment and its associated resources (Turcu and Gillie, 2020). In other words, although the preparation process did not form part of the formal planning process, the Strategies are of high relevance for planning. Besides, regarding how the climate emergency agenda was addressed in the Strategy, it is evident that most Strategies are centred upon net zero carbon emission targets for either the LA, the borough, or both (for table see Appendix). This shows that the Strategies are mostly in line with the wider national net zero agenda, which concerns balancing between emissions produced and removed from the atmosphere (ONS, 2019). In other words, the concept of climate emergency has largely been translated into the socio-political realm of strategic documents with particular emphasis on emissions reduction and balancing, in which the implications of such emphasis will be further explored below.

5.1.1. The Strategy as Integration Instrument

The Strategy can be seen as an integration instrument for realising the nexus as it provides an overarching framework in which diverse actors (Actor Relationship), climate-related scientific

knowledge (Knowledge) as well as other strategic planning and sectoral documents (Integration), such as the Local Plan, are addressed (Table 4):

Actor Relationship

While over half of the Strategies have indicated some forms of stakeholder engagement during the preparation process (10 out of 18), the level of details in the Strategies varies as some have not specified the scale and methods of engagement as well as how internal stakeholders were engaged. Since such details are key to the understanding of LAs' capacities for realising the nexus, findings from interviews in relation to this aspect are incorporated in the following sub-section to generate further insights.

Knowledge

Nearly all Strategies have incorporated climate-related scientific knowledge to varying degrees in terms of the variety of referenced sources and the scale at which the information was collected as supporting evidence (17 out of 18), ranging from scientific reports published by the Intergovernmental Panel on Climate Change (IPCC) to place-based socio-economic data. Despite such variations, it is recognised that borough-wide carbon emission data, either national statistics published by the Department for Business, Energy & Industrial Strategy (BEIS) or local statistics from independent technical study produced by consultants, is the most commonly referenced piece of information. The prominence of carbon emission data across all Strategies could be associated with the aforementioned emphasis of the Strategies on carbon reduction.

Integration

All Strategies have addressed other integrated and sectoral plans and strategies to varying degrees but they generally share a common principle, as suggested by interviewees, that they intend to '*provide linkages between*' and '*add value*' to these existing and potentially upcoming documents (SC 1, 2, 5). One could suggest that the Strategy functions as an integration instrument by connecting plans and strategies relevant to management of the built environment and resources with the climate emergency agenda, or net zero agenda, through which realisation of the nexus is achieved. However, the extent to which and how the Strategy may influence planning-related documents remains unclear in most Strategies, which will be further discussed below.

Table 4. Exploratory content analysis of adopted/draft Strategies (Please see Appendix for sample)

Borough	Actor Relationship	Knowledge	Integration
Brent	X	X	X
Camden	X	X	X
Ealing	X	X	X
Enfield		X	X
Greenwich	X	X	X
Haringey	X	X	X
Harrow		X	X
Hillingdon		X	X
Hounslow	X	X	X
Islington	X	X	X
Lewisham		X	X
Merton	X	X	X
Newham			X
Richmond upon Thames	X	X	X
Southwark	X	X	X
Sutton		X	X
Tower Hamlets		X	X
Wandsworth		X	X

Findings of the exploratory document analysis generally support the understanding of the Strategy as an attempt to realise the nexus through utilising scientific knowledge in its reasoning as well as recognising linkages between the climate emergency agenda and other strategic documents that are relevant to planning. Results of the SNA based on findings from interviews

will be presented below to further explore opportunities and challenges in relation to actor relationship.

5.1.2. Formulating the Strategy through Coordinated Collaboration

Realisation of the nexus, underpinned by the process of formulating the Strategy, was largely facilitated by key institutional actors through coordinating cross-departmental collaboration and engagement with external stakeholders. This is evident in the results of the SNA, in which the structure of relationship was featured by relatively high degree of centrality (Figure 12). In general, a dedicated person or team (climate staff), in which some interviewees (all SCs) were part of with expertise in climate change and potentially other areas coordinated between a wide range of actors to facilitate a largely collaborative process in the run up to adopting a Strategy. As demonstrated in the aforementioned interviewee profile (Table 3), SCs generally have related expertise and roles other than climate change, such as energy and transport, in which the multi-disciplinary nature could be a contributing factor to their ability to coordinate the work around the Strategy.

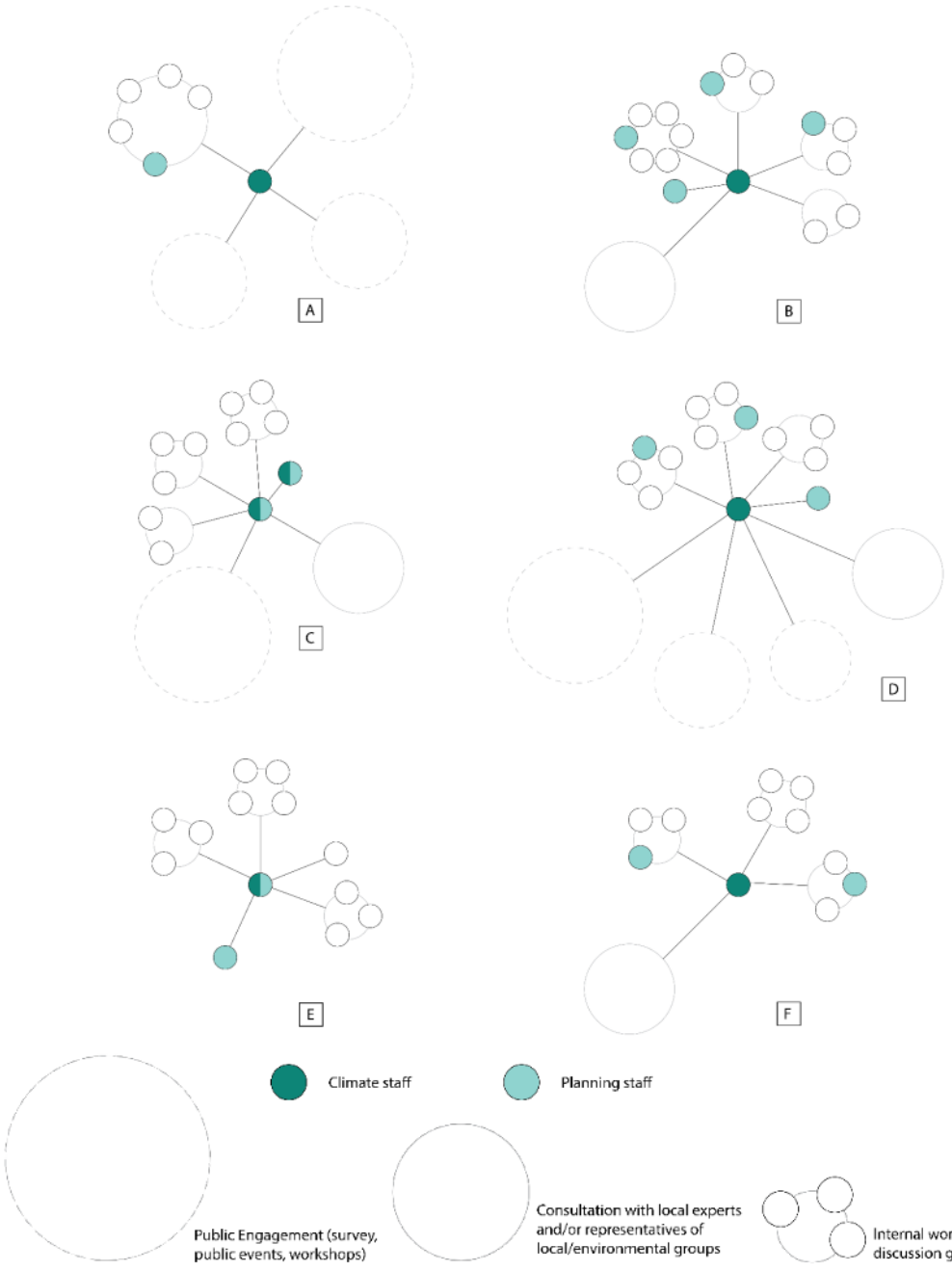

Figure 12. Approximated actor relationship in the process of formulating the Strategy for each sampled borough in no particular order (Due to shared staffing arrangement and to avoid duplication, one of the samples represent two boroughs in terms of internal relationship, and that information about external engagement is unavailable for one of the boroughs. Note that the

number of participants or departments is indicative as level of details available for each sample vary)

An opportunity for realising the nexus through this model of coordinated collaboration is that it enables actors within the institution to jointly identify connections between the climate emergency agenda and the LA's existing roles and responsibilities in relation to planning, in both the broader sense and in terms of the established planning department. This was achieved through the formation of internal working group(s) coordinated by climate staff that enabled cross-departmental interactions (Figure X), in which participation pattern of planning staff differed from other internal staff apart from climate staff in the sense that they participated in multiple working groups and/or throughout the preparation process. The importance of early and whole-process engagement with planners was recognised by interviewees with particular remark to the cross-cutting nature of planning:

> '*we had a colleague from planning involved in the working group throughout […] and the planning element of it wasn't just one aspect*' (SC 5)

> '*We engaged with planning colleagues fairly early on because we knew that planning was an important part of any sort of climate related strategy and action plan*' (SC 2)

> '*(the SC) acknowledged this early on because she said planning isn't, you know, it cuts across many of the themes […] I've had input to various*' (PP 7)

However, Sample E did not follow such trend as planning staff mainly interacted with climate staff bilaterally. Barriers to adopting a whole-process approach to participation by planning staff will be further discussed below.

Besides, planning staff's personal interests in and awareness of climate change may also enhance such opportunity. Personal interests and awareness, and advocacy in one case, were recognised by SCs in a positive light:

> '*I think we involved them because of the role that they had but it just so happens that the individual as a person is also very environmentally aware*' (SC 5)

> '*I do have some advocates in the planning policy team that are really, you know, huge advocates for climate change.*' (SC 1)

'*the planning officers […] all happens to be extremely environmental and are personally passionate about climate change*' (SC 3)

There were also cases where planning staff have gained confidence through the preparation process and potentially beyond in becoming more vocal about climate change, in which the idea of confidence emerged and was understood by interviewees in different ways. While it first emerged from a dialogue about planner's familiarity with the topic of climate change, in which the interviewee commented that '*they had a good amount of knowledge already, I don't think they had the confidence to express it straightaway because it was a bit of a newer area*' (SC 2), other interviewees interpreted confidence in relation to limitations to the extent to which planners can be vocal in negotiations on climate-related objectives and the potential to empower them through policy-making (SC 3, 6). One could suggest that creating an enabling institutional context within which such passion can drive actions could be a way to enhance LAs' actor-based capacities.

In cases where climate staff has been a key source of climate-related information for planning staff, the concentration of expertise in relation to climate change can put pressure on climate staff and potentially limit the extent to which LAs can realise the nexus in terms of integrating climate considerations into its planning functions as well as other functions that relate to the management of the built environment and resources. This could be the case for some as a SC recognised in relation to climate-related queries in development management, '*everybody comes to me, I mean, it's, it's really busy if I'm honest. It's crazily busy*' (SC 4). In this sense, building in-house information-based capacities on a departmental level would be key in the long run, in which there has been some work done in relation to building such capacities alongside proactiveness of planning staff:

'*we've had someone delivering some bespoke training sessions for them so that they're prepared for the new London plan and what the requirements are around sustainable buildings*' (SC 6)

'*we do a weekly policy briefing where we do horizon scanning […] And in that, we've now added a climate change section […] Quite a few of the planning team do get that and I have had some feedback that they found that quite useful […] they did take it upon themselves, I think, to develop some of their knowledge*' (SC 2)

While the forms of training and capacity building may differ, nevertheless, this could be a potential area where LAs may look to further develop in order to better realise the nexus and potentially beyond.

5.1.3. Engaging and Network-building

In addition to internal collaboration, engagement with external stakeholders was identified as another key opportunity for LAs to build actor-based capacities, in which two main types of approach were identified (Figure X). The two approaches encompass different features and were pursued in particular ways largely based on local circumstances at the time. Consultation with local experts and representatives enabled pooling of expertise that enhanced the Strategy to varying degrees (Sample B, C), in which involvement of representatives from local groups in particular was beneficial for making initial connections with existing networks of local actors that could potentially serve as the foundation for post-Strategy engagement in the optimisation stage (Sample B). Yet, the extensiveness of such approach may be relatively limited comparing to the other form of public engagement activities, which helped to gather public opinions and support for the Strategy while bringing the public on board at the realisation stage (Sample D).

Besides, it can be seen that there were arguably greater variations in the scale and diversity of external engagement in comparison to internal collaboration, in which a number of factors may be associated with such observation. In some cases, the scope of engagement is associated with the Strategy being viewed as an immediate response to the climate emergency and that greater emphasis was placed on the LA's own operation, in which further engagement was expected to take place after adopting the Strategy (Sample B and E). Another factor concerns impacts of the pandemic as a barrier to LAs' ability to carry out planned, extensive engagement events (Sample F). In response to such barrier, attempts were made in both Sample B and F to mitigate such challenge by utilising digital tools such as Microsoft Teams to carry out online consultation. In particular, the SC of Sample F reflected on the potential advantage of online consultation in relation to scale, stating that '*you can basically have a stadium of people and no one has to leave the comfort of their front room. […] that's going to be interesting how the form of engagement changes as well.*' Another challenge was identified to be associated with the availability of resources in terms of staffing, as a SC recalled, '*(some) local authorities have done quite extensive participatory type community engagement exercises in the run up to their action plans. We are*

quite small team in (Borough), so we weren't able to do that' (SC 5). This shows that the pandemic and availability of resources constitute two key barriers to extensive engagement at the time.

5.2. Optimising the Nexus: Beyond the Strategy

Building upon findings about opportunities and barriers for LAs to realise the nexus, this section further explores optimisation of the nexus through delivering and facilitating work around and beyond the Strategy. It can be seen from the matrix that, while all Strategies have addressed strategic planning documents as key tools through which LAs will deploy to achieve climate objectives in relation to planning, Carbon Offset Fund (COF) has appeared in the most Strategies in comparison to other instruments (16 out of 18) (Table 5). COF as a resource-based mechanism is associated with London Plan 2021 Policy SI2, previously alongside London Plan 2016, which states that 'major development should be net zero-carbon' and that 'a minimum on-site reduction of at least 35 per cent beyond Building Regulations' is required (Mayor of London, 2021a, 342). Where further reduction is demonstrated to be unachievable, applicants can offset the remaining shortfalls in the form of cash contribution, which forms part of Section 106 (s106) contributions. As COF is specifically designed in relation to net zero target for development, one could argue that its prominence across Strategies may be associated with the aforementioned emphasis on carbon reduction. The following will demonstrate some of the opportunities and barriers associated with this particular instrument and the broader use of planning policies, interpreted from interviews.

Table 5. Planning-related influencing mechanism indicated in the Strategies

Borough	Influencing Mechanism					
	Strategic planning documents ie. Local Plan, London Plan	Specific Instrument				
		Carbon Offset Fund (COF)	Other planning conditions eg. Circular Economy Statement	Monitoring enforcement and/or delivery of planning policy	Strategic Environment-al Assessment and/or Sustainability Appraisal	Planning guidance document
Brent	X	X	X			
Camden	X	X				
Ealing	X	X	X	X	X	
Enfield	X	X	X			
Greenwich	X	X	X			
Haringey	X	X	X			X
Harrow	X	X			X	X
Hillingdon	X		X			
Hounslow	X	X		X		X
Islington	X	X				X
Lewisham	X	X	X	X		X
Merton	X		X			
Newham	X	X	X			
Richmond upon Thames	X	X	X	X		X
Southwark	X	X	X			X
Sutton	X	X	X	X		X

Tower Hamlets	X	X	X			
Wandsworth	X	X	X			

5.2.1. The Carbon Offset Fund: "Last Resort" Mechanism and Resources for Climate Actions

The COF arguably constitutes both an opportunity and challenge to LAs for optimising the nexus. On one hand, COF was seen as designed with an intention to encourage on-site carbon emission reduction, echoing with a recent COF monitoring report that deems it as a 'last resort' mechanism for development to meet net zero target as defined in London Plan (Mayor of London, 2021b):

> '*it's about incentivising them to do more on site*.' (PP 7)

> '*the real kind of intention initially of it was that if you can't comply, you try your best to comply. And then, in the worst-case scenario, you pay*.' (DMPP 9)

On the other hand, it also constitutes one of the few sources of funding available for some LAs to plan for and deliver climate commitments made in the Strategies. Coupled with concerns over future cost of retrofitting for any development that is currently being built with a shortfall (SC 1, 2, 3), mixed feelings about the COF were evident as interviewees commented:

> '*I don't want people to pay into the carbon offset fund, which is, seems perverse because we haven't got any money, but I don't want them to*.' (SC 5)

> '*carbon offset funding is specifically designed to raise money for low carbon projects but from mine and [a colleague's] points of view, they shouldn't be paying carbon offset money. They should be developing zero carbon properties and that would be much more valuable.*' (SC 3)

This shows that while COF contributes to enhancing LAs' resource-based capacities in terms of generating funding for climate projects, there was agreement over on-site reduction measures as being much preferred and valued for achieving net zero development over cash contribution for offsetting.

Furthermore, perceived mixed feelings about COF were further complicated by a number of other challenges, including concerns over effectiveness of the current pricing system, challenges in enforcement and the extent to which it enables delivery of adequate carbon savings. Foremost, its effectiveness was discussed in relation to mismatch between price of carbon, established either in line with the regional price at £95/tCO_2 or locally based on local evidence, and the cost of on-site reduction measures:

> '*we know that that is not effective, that developers will pay that in a heartbeat so that they don't have to do more with the design and develop it.*' (SC 1)

> '*I think, yeah, that in certain circumstances, some developers see it as an easier way out*' (SC 6)

> '*That does actually encourage compliance because it's cheaper to pay the carbon offset fund than it is to deliver on the site.*' (SC 7)

Such recognition largely echoes with findings of a joint study on carbon pricing that the current regional price 'do(es) not incentivise sufficient savings on site' (Etude et al., 2020, 4). In addition, potential disconnections between what has been designed and what gets built may also add uncertainties to the effectiveness of the COF, partly due to inconsistency in the metrics that are currently being used to model energy performance, such as the Standard Assessment Procedure (SAP):

> '*there could be quite a big disconnect with what's in those (SAP) spreadsheets and what's actually been built*' (SC 3)

> '*we do our own monitoring in (Borough) to understand that […] this SAP software is saying this, it then gets built and it doesn't achieve anywhere near the savings it was expected, but some cases achieve even more savings […] either way, we want to be accurate in terms of what we're doing*' (PP 7)

It can be seen that concerns over the effectiveness of pricing system and difficulties in enforcement arguably constitute a barrier to optimising the nexus through this mechanism.

In addition, effectiveness of this mechanism was also discussed in relation to the extent to which it generates adequate resources for delivering carbon savings. On one hand, there was

realisation that delivering savings adequate to balance out shortfall on-site with funding collected through COF solely is challenging, as it was recognised that '*it won't deliver the equivalent amount of savings that we were expected to be delivered on-site.*' (SC 1) This was further complicated by the recognition of delay between agreement and collection of COF, and the continuous reduction in carbon content of electricity over time. This leads to potential mismatch between speed at which technologies evolve and of the planning and administration process, which could further hinder the extent to which LAs can build resource-based capacities through the COF solely, as one interviewee suggested:

> '*the carbon content for electricity is steadily falling, which means that to get the same saving, you have to do twice as many interventions, but you only got the same amount of money that was secured 6 years ago.*' (SC 4)

In response, joining up funding from diverse sources as an alternative mechanism, also recommended by the GLA (Mayor of London, 2021b), was deployed to mitigate such challenge, in which there are opportunities to further engage with private actors as one interviewee recalled:

> '*the way that we deliver a lot of the schemes in (Borough) is through kind of joint funding. […] it's kind of generating that private investment into delivery of the measure as well.*' (SC 4)

This model largely corresponds with the view that there needs to be a more '*collaborative kind of partnership-based approach with other people beyond the Council*' (PP 7) in the future for fully optimising the nexus. It shows that while the COF was designed to equip LAs with rule- and resource-based capacities, actor-based capacities can be mobilised to amplify the impacts of this mechanism.

5.2.2. Temporal Dynamics of Plan-making and Evolving Technologies

Moving beyond specific instrument, strategic planning documents, namely the Local Plan, constitute an integration instrument at the stage of optimisation. Timing in terms of LAs' position in their policy development cycle was perceived to be a key factor that either enable or impede transition from realisation (Strategy) to optimisation (Local Plan). Where the sampled boroughs were in early or consultation stage of the LP process, interviewees recognised opportunities in facilitating such transition:

'*there's a good alignment in terms of timing with our overall planning policies because (Borough) has just finished consulting on our new core strategy. So, the sequencing of the development of our action plan has allowed, you know, that fed into the development of the policies*' (SC 5)

'*we knew that there was an opportunity to put quite a bit of stuff in (the Strategy) around urban planning that will be tied into the local plan process*' (SC 2)

'*it's just lucky that we had the local plan out to consultation, and we were able to push it (the Strategy) forward when we did because the last time the local plan was changed was in 2011.*' (SC 3)

However, where there is a recently adopted LP, the extent to which further optimisation can be achieved in the short term is arguably limited despite recognition of the need to address the climate emergency through planning. This corresponds to the observation from the SNA, in which planning staff's participation in Sample E was mainly featured by bilateral communication with climate staff. The lack of opportunity for transition at the moment, coupled with an intention to do so, was evident:

'*The climate emergency declaration, I wouldn't have said has the ability to influence our planning policy because we've only just adopted the local plan. […] if we are a local authority and we are currently drafting our local plan, then I think the climate emergency would definitely form a bigger part of the local plan.*' (SC of Sample E)

One could see that variations in LAs' position in their policy development cycle may lead to variations in the extent to which they can facilitate transition towards optimisation following adoption of a Strategy.

In addition, although it was recognised that the gap between adoption time of the Strategy and the next LP review may constitute a potential barrier for optimisation at the moment, alternative tool has been deployed to mitigate such circumstance. For instance, in the sampled borough where there is lack of opportunity to utilise the LP process in the short run, the area action plan (AAP), which is more '*geographically specific*' (PP 8) than the LP but is currently due for an update, was seen as an opportunity for facilitating such transition. There was intension to use the

AAP as a site of experimentation, in which planning policies, informed by the climate emergency agenda, can be tested to yield evidence for supporting the next iteration of the LP:

> '*that's kind of my hope [...] to actually have some data I guess on how these policies have worked in a smaller local area to go into the next local plan update*' (PP 8)

One could see that despite variations in local circumstances, alternative instrument, even though impacting a relatively smaller area, can be identified and deployed. This demonstrates the greater level of complexity and variations in progress towards optimisation comparing to realisation, in which LAs need to identify and make best use of available mechanisms that suit their local context.

5.2.3. Balancing Priorities: Cost of Net Zero

Apart from the LP process, opportunities and challenges have been identified in relation to the substantive aspect of planning policies and the planning process in general. It was recognised that planning policies serve to create a space for planners '*to negotiate and get a workable solution*' (SC 3). It was also realised that the sense of urgency associated with the narrative of the climate emergency needs to be reflected in decision-making:

'*the emergency is about us from a decision-making point of view, from a financial point of view, from being brave enough to stand up and make commitments and then back that up with action, and among that is our outlook on planning.*' (SC 5)

This leads to further exploration of whether the sense of urgency has impacted planning in this respect, in which there was agreement over the role of planning in balancing priorities and that affordable housing delivery was deemed as a potential competing priority:

'*there is a balance to be had here because another one of our big priorities is affordable housing*' (SC 5)

'*for planning, I think there is a bit of a conflict between affordable housing and low carbon development [...] it's about finding that balance between the two, and they're both really important.*' (SC 2)

In particular, the costs of both priorities were seen as the key issue at stake as one SC commented that '*the main competing priorities are needs to deliver homes versus needs to deliver net zero homes because there is a cost, there's an inherent cost to net zero.*' (SC 6). Such emphasis on

competing costs could be connected to the aforementioned prominence of the COF, which is collected through s106 contributions alongside affordable housing contribution. The nature of the COF being a value capture mechanism means that it could be facing similar challenge as affordable housing contribution has been in terms of viability, if not worse due to potential competition. Such challenge was recognised, '*ultimately when it comes down to arguing viability, we don't have a lot of tools to really resist that at this point, for everything really.*' (PP 8). This shows that while the climate emergency agenda has been interpreted as encouraging prioritisation of climate issues in decision-making, the extent to which it has influenced how climate objectives are weighed against other planning priorities remains unclear.

5.2.4. Innovation and Risks: Achieving Beyond the Regional

Moreover, regarding vertical integration in planning policies, while it was recognised widely by interviewees that there is general alignment or intension to align through the LP process with the new London Plan on climate change policies, there was actions taken to create more '*stringent policies*' locally due to a number of factors (SC 3). Firstly, emerging evidence, such as the Climate Emergency Design Guide published by London Energy Transformation Initiative (LETI) and the aforementioned carbon pricing study, has generated new insights and identified potential areas for improvement in current policies. However, since the new London Plan has just been adopted in 2021, it is not in a position for further development at the moment despite emerging evidence. Besides, the impact of regional policies could vary across boroughs due to variations in local context. For example, the regional net zero policy currently applies to major development only but in boroughs where there is a '*very low proportion of major applications*' (SC 3), the impact of this policy on development and the amount of COF collected may be different from boroughs where there is greater proportion of major development. Hence, while alignment with regional policies constitute the baseline, considerations of going beyond the regional were present and that capacities of LAs in policy-making become key to such considerations.

Yet, challenges have been identified around aiming beyond regional policies. The first one being the availability of evidence to support such ambition and, if unavailable, the time cost of preparing evidence base:

> '*we haven't gone beyond the London plan in our targets there but [...] where there is an evidence base, there is a willingness for us to do that.*' (SC 5)

'*We have ideas around things that we want to do [...] in of setting policies which go beyond the London Plan, and obviously that involves developing evidence base as well to do that but it just takes time for us to do that.*' (PP 7)

Besides, the risk of lacking alignment with regional or sub-regional neighbours was also raised. This could be challenging as it increases uncertainties associated with relatively higher costs of development comparing to neighbouring boroughs, at least in the short run, in which there was '*hope*' that initiation by one borough may trigger others to follow over time:

'*what we're hoping is that if we get ours through, then loads of other people will develop consistent policies. But in practice, we don't know whether that's going to happen.*' (SC 3)

The perceived uncertainties and associated risks in innovation have led to the recognition of the significance of precedence:

'*seeing other people successfully try things is very important because it de-risks your own activities*' (SC 3)

It can be seen that despite recognition of the need and willingness to achieve beyond regional policies in some cases, and the ability of LAs to do so in theory, time needed to prepare evidence base and uncertainties associated with being different from neighbours at least in the short term constitute barriers to implementing such ambition in practice.

5.2.5. Beyond Planning Policies: Regional and Sub-regional Collaboration

Collaboration between LAs on a regional and sub-regional level was deemed as another opportunity through which the nexus can be optimised. Effective coordination by regional and sub-regional organisations in particular is crucial to enabling and encouraging such collaboration. On a regional scale, London Councils was recognised as a key organisation that coordinates regional collaboration over a range of workstreams in relation to climate change, in which many relate to managing the built environment and its associated resources (SC 2, 4, 5, 6). On a sub-regional scale, a SC was aware of a group coordinated by the West London Waste Authority (WLWA) with its constituent members to facilitate experience sharing in relation to work around climate change:

'*West London Waste Authority were kind of organising this group […] and they kind of coordinated, well they still do, they still do coordinate it, which is really helpful*' (SC 2)

It was also recognised that there are variations across sub-regional organisations in terms of their proactiveness in tackling climate issues, partly due to the presence of other priorities and varying capacities of members:

'*West London is definitely much further ahead on that than anyone else that I've come across. […] For [subregional partnership B], we've had a few meetings and we're trying to kick start something up to get a bit more collaboration and sharing information but its slowish going so far I think partly because, you know, the priorities for the people are not on climate change as much right now, it's more on sort of covid recovery*' (SC 2)

Recognition of variations in priorities was echoed alongside realisation of differences in progress, in terms of planning for and implementing climate actions, as potential barriers to collaboration on a sub-regional level, as a SC commented that '*any partnership working could be challenging, people have got different priorities, they're at different stages of their kind of climate action journey*' (SC 6). Nevertheless, this demonstrates the importance of effective coordination for cross-borough collaboration over work around optimising the nexus.

Furthermore, '*economies of scale*', or more efficient use of resources, was recognised as a key benefit of cross-borough collaboration (SC 6, PP 7). Recognising complexities associated with temporal dynamics of policy-making, joint development of evidence base, either on a regional or sub-regional scale, that can then be used by individual LAs to support their LP processes could be an alternative mechanism for supporting optimisation of the nexus. Such approach benefits from economies of scale not only in terms of financial resources but also enables LAs to pool expertise, as it was recognised:

'*each authority brings with it different strengths […] because we don't all have the same expertise or kind of specialist knowledge […] you kind of play to each authority's individual kind of strengths really in terms of what they can bring to the table*' (PP 7)

The aforementioned carbon pricing study is a recent example of such approach as five LAs from across London jointly contributed to it. Joint contribution alongside the use of London-wide data have arguably enhanced its usability not only for the LAs that participated throughout but also

other LAs across the city. In particular, it constituted an opportunity for those that are in a favourable position in their LP process, as a SC recalled, '*we couldn't find any evidence until that study was out […] we weren't there at the beginning but we were the first ones to use those results*.' (SC 3). It can be seen that such approach enables LAs to build actor- and resource-based capacities, through which information-based capacities can be built. Subsequent diffusion across the city in terms of utilising the new information by other LAs in their LP processes also demonstrates the extensiveness and flexibility of such approach as an opportunity to support optimisation of the nexus.

6. Discussion

Following from the sample-focused analysis, implications of the findings to the case of London and potential lessons learnt are discussed in the first section with reference to literature, followed by broader reflections on the nexus approach and connections with wider literature. More specifically, lessons for LBs are drawn from the findings, reflecting on the extent to which and ways in which local institutions can build capacities for realising and optimising the nexus. This is followed by a response to the research question and a discussion reflecting on the nexus approach, in which significance of this research in terms of its contribution to the wider literature is recognised.

6.1. Case-wide Implications: Lessons for London Boroughs

From the experiences of some of the forerunners in London, it can be seen that establishing actor-based capacities both internally and externally is key to the realisation of the nexus, or making initial progress in addressing the climate emergency agenda and connecting it with planning-related functions of local institutions. Internally, actor-based capacities can be built throughout the process of preparing the Strategy through establishing working groups, dedicating staff or team for coordination and potentially creating communication channels for subsequent interactions, in which these mechanisms enable institutional actors to jointly identify and act upon collective challenges (Koop et al., 2017). As demonstrated in some cases, offering additional support where appropriate to planners and other internal staff, such as training sessions and regular updates on relevant information, in the process of realisation and potentially beyond can help to build in-house information-based capacities and avoid having climate change expertise siloed. This could in turn enhance the institution's overall actor-based capacities in the long-run. Besides, apart from the more rational justification for planning staff's participation in the realisation process such as relevance of their roles, personal interests in and awareness of climate issues even prior to the preparation process could potentially contribute to creating an institutional culture, corresponding to a sociological institutional perspective (González and Healey, 2005), and hence an 'action space' within which staff members may feel more able to seek for opportunities to enact change in relation to the nexus.

Furthermore, external engagement and potentially networking with local stakeholders during the process of realisation can enhance and amplify internal capacities. Coupled with the recognition that a more collaborative mode of relating with external stakeholders is needed to fully realise and optimise the nexus, relationships and connections established through early engagement could form the basis for future collabosration. This means that, while the key connection between internal and external stakeholders at the realisation stage may be the dedicated coordinator(s) within the institution, as demonstrated through the SNA, local institutions may seek to enhance their actor-based capacities beyond realisation in the medium- to long-run by seeking opportunities to collaborate with external stakeholders and participate in more networked forms of working relationship. Through a collaborative model of engagement, the significance of local institutions in climate response in terms of their closeness to local stakeholders can arguably be better realised as well (Hoppe et al., 2014).

Considering the optimisation phase, planning policy constitutes an important tool through which rule-based, and resource-based in the case of the COF, capacities can be built for optimising the nexus. London Plan Policy SI2 arguably forms the basis for local institutions to build rule-based capacities upon, as it cuts across multiple sectors including but not limited to climate change, energy, planning and urban design, demonstrating the potential of planning policy in facilitating horizontal integration (Stead and Meijer, 2009; Holden, 2012, cited in Lowe et al., 2018). However, the nature of the COF as an associated mechanism to Policy SI2 being a value capture mechanism arguably makes it difficult for planners to negotiate when other priorities, such as affordable housing delivery, are demonstrated through viability assessment to be impacted by the application of this tool. Such realisation largely resonates with earlier findings about 'housing targets and viability rules' being part of the reason why the planning system has been a barrier to delivering net zero through planning in the UK (Marix Evans, 2020, 33). In addition, while this may be beyond the control of local institutions, more flexible local resources dedicated for climate actions other than the COF are also recognised to be key in the long-term in order to reduce reliance on, either implicitly or explicitly, the COF as there is potential conflict between using it to incentivise on-site emission reductions measures and the need to secure funding for delivering climate actions. Regarding vertical integration, while regional-local alignment in planning policy is widely recognised and achieved, due to circumstances associated with regional policy development cycle, emerging evidence and local development context, considerations about and actions aiming for

overachieving regional policy emerged. Yet, while there is will to achieve beyond regional requirements, it was identified as challenging and potentially risky in practice.

Besides, more broadly speaking, utilising the 'transformative potential' of decision-making in relation to planning, as Hoppe et al. (2014) anticipate, is key. However, it is also recognised that the extent to which one could progress from realisation to optimisation through making or renewing LP policies, which provide a framework within which decision-making is situated, in a timely manner following the adoption of a Strategy is likely to depend on local context in terms of position in the LP process. As demonstrated in Figure 13, spatial variations in progress are evident. Building upon initial findings in the Scoping Strategy Chapter that there are local variations in progress in terms of adopting a Strategy, or realising the nexus in the context of a climate emergency, variations in terms local policy development cycle could imply that the extent to which boroughs that have adopted a Strategy can facilitate timely transition towards optimisation also varies. While boroughs that are at their early stage of developing or have an early draft of their LPs (green) may be in a favourable position to facilitate such transition in the short- to medium-term, others may need to explore alternative mechanisms, in which the AAP is an example of a potential option if available. The use of APP in particular constitutes a sign of policy experimentation, in which the intention to replicate it at a borough level if successful echoes with Vogel and Henstra's (2015) discussion on local experimentation. Nevertheless, the extent to which policy-making as an integral part of local institutions' rule-based capacities can be built for optimising the nexus in a timely manner varies spatially across the city and that one should seek for mechanisms appropriate to local circumstances.

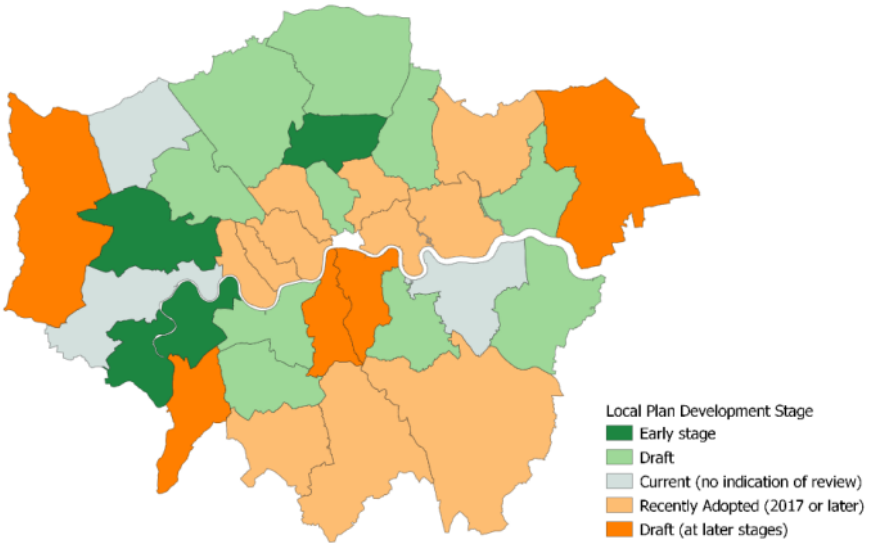

Figure 13. LP Development Stage across all LBs

Furthermore, while there are complexities associated with local policy development cycle, which could potentially lead to lack of alignment between boroughs in the short- to medium-term, proactively seeking opportunities for regional and sub-regional collaboration could help to mitigate such concern to some extent. This could be the case in West London, as it can be seen that although West London boroughs are at different stages of their LP process (Figure 13), majority of them have published a Strategy, either in draft form or fully adopted (Figure 14). This may imply the significance of the sub-regional, which is not often recognised in literature, in facilitating strategic alignment despite varying local circumstances and limited opportunity for policy development at the regional for a period of time. In addition, diverse forms of cross-borough collaboration can be explored such as experience sharing, which enhances information- and potentially actor-based capacities, and co-development of evidence base, with the benefits of economies of scale in relation to resources and expertise as well as flexibility and applicability in terms of further enhancing rule-based capacities. The latter in particular has the advantage of enhanced usability of information, recognised by Romero-Lankao et al. (2018) as key to effective climate governance. Its potential in driving diffusion of information that can inform policy-making also echoes with Heaton and Britten (2015) on the benefits of coproduction as enabling devolution of climate-planning knowledge through joint 'evidence generation' (Tangcharoensathien et al.,

2021). Besides, while regional organisation such as London Councils has been fairly proactive in coordinating work across climate change and the built environment/resource management, variations in proactiveness and interests regarding climate issues across sub-regional organisations mean these existing networks of relationship can and should be better utilised to facilitate collaboration and potentially alignment in position in terms of realising and optimising the nexus. In particular, progress achieved in West London shows that proactiveness of sub-regional organisation in coordinating and keeping a focus on climate issues is important to the success of sub-regional collaboration.

Based on such recognition, existing sub-regional bodies across London is identified (Figure 14), including joint waste authorities and partnership for waste disposal as well as strategic partnerships that cover a wider range of topics, in which some are highly relevant to planning. For instance, both Local London and South London Partnership have workstreams for housing and infrastructure while Central London Forward focuses more broadly on placemaking (Central London Forward, n.d.; Local London, n.d.; South London Partnerhsip, n.d.). For other sub-regional organisations or partnerships that are progressing at the realisation stage, initiation by members within the network could be beneficial to encouraging proactiveness of the sub-regional body. In cases where the focus has been on other priorities, seeking for opportunities to integrate climate issues or even the nexus with existing priorities by identifying synergies between them may also help with initiating conversations about and progress towards realising the nexus.

Figure 14. Existing sub-regional authorities and partnerships across London

6.2. Capacities for Realising and Optimising the Climate-Planning Nexus

Through the case study, this research demonstrates that **local institutions can build various types of capacities for addressing the climate emergency agenda through planning in an integrative manner to great extent through processes of realising and optimising the nexus**. More specifically, to facilitate realisation of the nexus, or to draw connections between the climate emergency agenda and functions of local institutions in relation to management of the built environment and its associated resources, actor-based capacities supported by appropriate level of resources were found to be crucial to facilitating such connections. To progress from realisation to optimisation and beyond, identifying synergies between capacities can help to enhance existing and further develop anticipated types of capacities. Yet, common elements that arguably thread through the two stages are collaboration and coordination in terms of actors, resources and information, through which many of the barriers can potentially be overcome or mitigated to some extent.

6.3. Situated and Experiential Knowledge: From Concept to Practice

This research contributed to the exploration of gaps between climate response through planning on a conceptual level and practices on the ground through an embedded case study

approach. By focusing on a single case and the processes through which urban governance of climate change and planning interacted, opportunities and barriers in implementing the conceptual in practice can be better identified and understood, echoing with wider literature that recognises the importance of processes and practices in governance-oriented studies for both climate change and planning (Marquardt, 2017; Turcu and Gillie, 2020). In addition, the qualitative nature of this research in terms of its approach to analysing text data, alongside the use of interviews with practitioners in both fields of climate change and planning, was particularly beneficial to gaining experiential knowledge about how climate-related considerations are integrated into the planning process in practice. It responded to Nagorny-Koring's (2019) recognition of the significance to learn from practical experiences in terms of problems or barriers in implementing 'political ambitions' associated with climate change mitigation measures in practice. Hence, contributing to addressing the gap and missed opportunity between 'best practice' and implementation.

6.4. Integrating the Climate Emergency Agenda into the Socio-political Realm of Planning

While existing literature has raised concerns over conveying sense of 'absolutism' by declaring a climate emergency that it may draw attention away from other equally important priorities (Hulme, 2019), such concern has not been realised in this research. Rather, in most instances, the impact of the climate emergency agenda in terms of leading to radical shift in the ways in which the planning process functions, including the regularity of policy development cycles and how climate-related priorities are balanced against other priorities in negotiations and policy-making, remains largely unclear. While this could be partly due to the difficulty associated with the lack of an immediate shock, as Salamon (2019) realised, that would stimulate such change, it also indicates the potential '*dissonance*', as suggested by a SC, between planning on one hand as offering some degree of regularity and certainty, and the climate emergency on the other hand which is featured by rapidly evolving context in terms of both natural and human factors. In this sense, one could suggest that while the climate emergency agenda has arguably raised profile and awareness of climate issues across local institutions and beyond, largely achieved at the realisation stage, it is less clear whether such momentum can in turn drive progress in optimisation due to a range of complexities and potential barriers. However, moving forward with the climate-planning nexus, it is believed in research that there ultimately

6.5. Reflecting on an Integrative Nexus Approach

A nexus approach enables one to explore multi-disciplinary subjects in a comprehensive manner as it enables one to identify potential synergies between disciplines. This is crucial for subsequent exploration of ways to address them in an integrative manner, which is important for understanding and potentially tackling issues that have a cross-cutting nature, such as the climate crisis. Cumiskey et al.'s (2019) framework has been an effective tool particularly for identifying core elements that underpin the governing processes of climate change and planning. However, by deploying an established framework across multiple stages throughout, flexibility of this research in capturing emerging themes may have been limited to some extent, in which future studies may seek to further innovate on the basis of Cumiskey et al.'s and this research's findings. Besides, while the framework has also enabled the identification of current and anticipated opportunities and challenges associated integrating climate change and planning, it does not necessarily offer an answer to a lot of the identified challenges. This means that further exploration may focus on potential solutions, for example for reconciling competing priorities between climate and beyond. More broadly speaking, by specifying climate change and planning as the two key subjects of the nexus while deploying a single case study approach, coupled with the recognition that the planning system within which the case city operates does not have as much influence over the existing built environment than over new development, there could be a missed opportunity in identifying other components that fall within the conception of planning by this research but operates beyond the studied planning system. Hence, this also constitute an area for future development, in which other relevant mechanisms appropriate to case context can be take into account.

7. Conclusion

To conclude, capacity building for local institutions to address the climate emergency agenda in an integrative manner through planning is achieved through dynamic processes of collaboration and coordination among actors, resources and information across multiple scales. While significance of the local scale in terms of understanding synergies between climate change and planning is widely recognised and emphasised in this research, there may be opportunities in further exploring perspectives from a regional or subregional point of view as this research demonstrates that regional and sub-regional organisations have been relatively proactive in this space. In particular, since cross-borough collaboration has been identified as an opportunity for supporting the integration of climate considerations into local policy-making, in the form of information and evidence diffusion, it would be beneficial to gain more in-depth understanding of the specific benefits and challenges as well as ways to better facilitate effective partnership building. Potential to establish working relationships between local institutions and external stakeholders is also an area that needs further investigation as this form of collaboration may not have been the norm in the past but is recognised as increasingly important for addressing the climate emergency agenda in managing the built environment and its associated resources.

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Appendices

Appendix 1 Sample rows from table for exploratory document analysis

Borough	**Addressing elements of the planning system**	**Engagement with diverse actors**		**Reference to climate and planning knowledge/data**	**Links to existing strategies and plans**
		Pre-Strategy	Post-Strategy		
Brent	Part of a thematic chapter 'Homes, Buildings and the Built Environment'	• Brent Climate Assembly • Youth Climate Summit with the Brent Youth Parliament • Public consultation on the draft Strategy (online consultation, workshops with specific social groups, comments from the Resources and Public Realm Scrutiny Committee, Brent Friends of the Earth and the Brondesbury	• Brent Environmental Network (schools, businesses, Housing Associations, Voluntary and Community Sector, Public Sector Organisations and the Council) • Liaising with TfL • Participation in communication campaigns • Partnership building with green and blue infrastructure-related	• Brent Carbon Scenarios 2030 Study • Guidance on applying the Waste Hierarchy (defra, 2011)	• Brent's Recycling and Reduction Plan • The Road to Zero (Department for Transport, 2018) • Brent Long Term Transport Strategy 2015-2035 • Draft Brent COVID-19 Transport Recovery Plan • Brent Cycle Strategy 2016-2021 • Brent Walking Strategy 2017-2022 • London Borough of Brent • Air Quality Action Plan 2017 – 2022 • Draft Brent Local Plan • London Borough of Brent Housing Asset Management Strategy [2020–2025]

		Park Residents Association)	organisations eg. Thames 21, Canal and River Trust • Identified specific departments across the Council to lead on specific climate actions		• Brent Two Year Stock Investment Plan 2020-2022 • London Plan • London Councils' Transport and Environment Committee & London Environment Directors' Network (LEDNET) Joint Statement on Climate Change • London Councils' Green Recovery Plan • Local Plan
Camden	Addressed in three of the four thematic chapters: 'People', 'Places' and 'Buildings' (more prominent in the latter two chapters)	• Online consultation (proposals from 2,500+ residents and groups, "the Sustainers" schools' sustainability group and the Camden Climate Change Alliance business network) • Camden Citizens'	• Camden Climate Change Alliance business network • Expert and stakeholder panel in relation to retrofit policy and programme • Private landlords and housing associations • 'large organisations' (universities, hospitals and private businesses)	• Intergovernmental Panel on Climate Change (IPCC) Special Report (2018) • UK local authority and regional carbon dioxide emissions national statistics (2017) • Camden Carbon Scenarios for 2025 and 2030 – An update to the 2010 Study (2019)	• Camden Transport Strategy 2019-2041 • Camden's Clean Air Action Plan • London Plan • Local Plan

		Assembly on the climate crisis			
Ealing	Dedicated chapter on identifying the role of planning across all thematic chapters: 'Energy', 'Nature & adaptation', 'Landuse and Travel' and 'Waste'	• Consultation on draft Strategy with the Citizen Review Panel (participants possess different expertise) • Proposals from community group (Ealing Transition)	• Schools and community champions ie. Ealing Transition • Adults (skills and career building in the green economy) • Community groups (online collaborative platform for resource and information sharing) • Businesses (High Streets Taskforce) • Identified specific departments across the Council to lead on specific climate actions • Working with the community on DIY retrofit of domestic buildings	• Living Planet Report 2020 - Bending the curve of biodiversity loss • Environmental Audit Committee's report on Sustainable Development Goals in the UK (2017) • Joseph Rowntree Foundation's report on Climate change and social justice: An evidence review (2014) • Ashden's Co-Benefits Toolkit built for Local Authorities • Carbon emissions estimates published by Department for Business, Energy and Industrial Strategy (BEIS)	• LEDNET Joint Statement on Climate Change • London Plan (emphasis on Good Growth) • Ealing's Biodiversity Action Plan • Ealing's Transport Strategy • West London Waste Minimisation Plan 2018-19 • Local Plan

			• Partnership with London Power on smart meter roll out	Local Authority (2018) • SCATTER tool (emission reduction pathway modelling based on national datasets and published projection scenarios) • Consumption-based GHG emissions of C40 cities report (2018)	

Appendix 2 Net zero targets across Strategies

Borough	Council-wide Target	Borough-wide Target
Brent	Unspecified	2030
Camden	Unspecified	2030
Ealing	2030	
Enfield	2030	2040
Greenwich	Unspecified	2030
Haringey	2027	2041
Harrow	2030	
Hounslow	2030	Unspecified
Islington	Unspecified	2030
Lewisham	Unspecified	2030
Merton	2030	2050
Newham	Unspecified	Unspecified
Richmond upon Thames	2030	Unspecified
Southwark	Unspecified	2030
Sutton	Unspecified	Unspecified
Tower Hamlets	2025	2050
Wandsworth	2050	Unspecified

Appendix 3 Themes extraction for exploratory document analysis

Borough	**Thematic Areas of Action Relevant to the Borough-wide Target**	
Brent	• Consumption, Resources and Waste • Transport • Homes, Buildings and the Built Environment • Nature and Green Space	Stakeholder Engagement and Lobbying
Camden	• Places • Buildings	
Ealing	• Energy • Nature • Travel • Waste • Planning	
Enfield	• Travel • Buildings • Waste • Energy • Natural environment	
Greenwich	• Buildings • New Development • Transport • Energy • Circular Economy • Natural Environment	
Haringey	• Housing • Non-Domestic Building and Workplace Emissions • Transport • Energy	
Harrow	• Domestic Energy • Sustainable Transport and Air quality • Planning and development • Natural Environment and Biodiversity • Sustainable Resource Management Waste Management Strategy • Flood Risk Management and Strategy	
Hounslow	• Retrofit Hounslow and deliver zero carbon housing • Sustainable travel promotion • A transition to electric mobility • Greening the borough • Develop net zero lifestyles • Stimulate the local green economy	

Islington	• Residential buildings, Commercial and Industrial buildings and Infrastructure • Transport • Sustainable Energy Generation and Supply • Affordable Energy and Fuel Poverty • The Green Economy and Planning • The Natural Environment, Waste Reduction and Recycling and Carbon Offsetting	
Lewisham	• Sustainable Housing • Decarbonised Transport • Greener, Adaptive Lewisham	
Merton	• Green economy • Buildings and energy • Transport • Greening Merton	
Newham	• Greening the Borough • Build a Green Economy • Develop an Energy Management Plan • Private Housing • Transport • Health (Retail and Food) • Waste Reduction and Recycling	
Richmond upon Thames	• Our legacy: Climate Change Mitigation and Energy Efficiency • Our waste: Waste and Plastics and the Circular Economy • Our air: Improving Air Quality • Our nature: Green Infrastructure and Biodiversity • Our water: Water Management and Flood Abatement	
Southwark	• Construction, building and • Energy • Transport and Travel • Biodiversity, Trees and Green Spaces • Consumption and Waste	
Sutton	• Cleaner air • A greener borough • Achieving net zero carbon Creating a circular economy • Tackling climate change (adaptation)	
Tower Hamlets	• Power • Buildings • Transport • Forestry, land use and agriculture	
Wandsworth	• Sustainable Transport • Air Quality • Energy Management	

	• Urban Greening and Open Spaces • Waste Management • Water Management and Flooding Resilience • Planning and Sustainable Development	

Appendix 4 Interview question prompt sheet (sample)

The questions fall under the themes of Actor relationship, Influencing mechanism, Knowledge, Intervention and Policy, based on the framework:

1. Question about years of experience, position, roles and responsibilities (anonymised)
2. I would like to learn more about how you have worked with the planning team as well as other internal and external stakeholders in drawing up the climate emergency strategies. Would you like to briefly explain this process?
    a. How did the planning team participate in this process?
    b. Have you recognised any changes in attitudes or practices after the declaration of a climate emergency?
3. In what ways do you think the climate strategies and action plans relate to other existing plans and strategies?
    a. Has there been any recognition of potential competing objectives?
    b. Have you worked with the planning team on other pieces of work after the Strategy has been adopted?
4. In your opinion, what are the key tools that the planning team has that contribute towards climate emergency response?
5. Besides formal mechanisms such as plan-making, has the borough ever participated in or are you aware of any joint study that relates to climate change and planning?
6. Have you recognised any opportunities or challenges in relation to resources for delivering climate commitments? And in what way do you think the planning process can contribute or has any implications to it?
7. Have there been any community engagement activities taken place following the adoption of the Strategy?
8. What do you think about the narrative of emergency?
    a. In the context of another emergency, do you think this narrative is still supported by wider stakeholders?

Appendix 5 Table collating information about Local Plan progress (prior 24 May 2021)

Borough	Progress	LP Progress	Additional information
Barking and Dagenham	Draft	Draft LP	Reg 19
Barnet	Draft	Draft LP	Reg 18
Bexley	Draft	Draft LP	Reg 18
Brent	Draft	Draft LP	Reg 19
Bromley	Adopted	Adopted in 2019	
Camden	Adopted	Adopted in 2017	
Croydon	Adopted	Adopted in 2018	
Ealing	Early stage	Early stage	Reg 18
Enfield	Draft	Draft LP	Reg 18
Greenwich	Current	2014-2028	
Hackney	Adopted	Adopted 2020	
Hammersmith and Fulham	Adopted	Adopted 2018	
Haringey	Early stage	Early stage	Reg 18
Harrow	Current	2012-2026	
Havering	Draft late stage	Draft LP	Late stage
Hillingdon	Draft late stage	Draft LP	Examination
Hounslow	Current	2015-2030	
Islington	Draft	Draft LP	Reg 19
Kensington and Chelsea	Adopted	Adopted in 2019	
Kingston upon Thames	Draft late stage	Draft LP	Examination
Lambeth	Draft late stage	Draft LP	Examination
Lewisham	Draft	Draft LP	
Merton	Draft	Draft LP	
Newham	Adopted	Adopted in 2018	
Redbridge	Adopted	Adopted in 2018	
Richmond upon Thames	Early stage	Early stage	
Southwark	Draft late stage	Draft LP	Examination
Sutton	Adopted	Adopted in 2018	
Tower Hamlets	Adopted	Adopted in 2020	
Waltham Forest	Draft	Draft LP	Reg 19
Wandsworth	Draft	Draft LP	
Westminster	Adopted	Adopted in 2021	

1 * Please select your programme of study.

MPlan City Planning

2 * Please indicate the type of research work you are doing.

- [ ] Dissertation in Planning (MSc)
- [x] Dissertation in City Planning (MPlan)
- [ ] Major Research Project

3 * Please provide the current working title of your research.

How, and to what extent can local actors and institutions build capacities to address the climate emergency age

4 * Please select your supervisor from the drop-down list.

Moore, Susan

Research Details

5 * Please indicate here which data collection methods you expect to use. Tick all that apply.

- [x] Interviews
- [ ] Focus Groups
- [ ] Questionnaires (including oral questions)
- [ ] Action research
- [ ] Observation / participant observation
- [ ] Documentary analysis (including use of personal records)
- [ ] Audio-visual recordings (including photographs)

- [ ] Collection/use of sensor or locational data
- [ ] Controlled trial
- [ ] Intervention study (including changing environments)
- [x] Systematic review
- [x] Secondary data analysis
- [ ] Advisory/consultation groups

6 * Please indicate where your research will take place.

UK only

7 * Does your project involve the recruitment of participants?

'Participants' means human participants and their data (including sensor/locational data and observational notes/images.)

(•) Yes ( ) No

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« »

Appropriate Safeguard, Data Storage and Security

8 * Will your research involve the collection and/or use of personal data?

Personal data is data which relates to a living individual who can be identified from that data or from the data and other information that is either currently held, or will be held by the data controller (you, as the researcher).

This includes:

- Any expression of opinion about the individual and any intentions of the data controller or any other person toward the individual.
- Sensor, location or visual data which may reveal information that enables the identification of a face, address etc. (some postcodes cover only one property).
- Combinations of data which may reveal identifiable data, such as names, email/postal addresses, date of birth, ethnicity, descriptions of health diagnosis or conditions, computer IP address (of relating to a device with a single user).

◉ Yes ○ No

9 * Is your research using or collecting:

- special category data as defined by the General Data Protection Regulation*, and/or
- data which might be considered sensitive in some countries, cultures or contexts?

*Examples of special category data are data:

- which reveals racial or ethnic origin, political opinions, religious or philosophical beliefs, trade union membership;
- concerning health (the physical or mental health of a person, including the provision of health care services);
- concerning sex life or sexual orientation;
- genetic or biometric data processed to uniquely identify a natural person.

○ Yes ◉ No

10 * Do you confirm that all personal data will be stored and processed in compliance with the General Data Protection Regulation (GDPR 2018)?

◉ Yes

○ No

○ No

○ I will not be working with any personal data

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11 * I confirm that:

- [x] The information in this form is accurate to the best of my knowledge.
- [x] I will continue to reflect on, and update these ethical considerations in consultation with my supervisor.

You **MUST** download a copy of your responses to submit with your proposal, and for your own reference. To do this, use the print screen function of your web browser, and print to PDF in order to save.

RISK ASSESSMENT FORM

FIELD / LOCATION WORK

The Approved Code of Practice - Management of Fieldwork should be referred to when completing this form

http://www.ucl.ac.uk/estates/safetynet/guidance/fieldwork/acop.pdf

DEPARTMENT/SECTION

LOCATION(S)

PERSONS COVERED BY THE RISK ASSESSMENT

BRIEF DESCRIPTION OF FIELDWORK

Consider, in turn, each hazard (white on black). If **NO** hazard exists select **NO** and move to next hazard section.

If a hazard does exist select **YES** and assess the risks that could arise from that hazard in the risk assessment box.

Where risks are identified that are not adequately controlled they must be brought to the attention of your Departmental Management who should put temporary control measures in place or stop the work. Detail such risks in the final section.

ENVIRONMENT	**The environment always represents a safety hazard. Use space below to identify and assess any risks associated with this hazard**
e.g. location, climate, terrain, neighbourhood, in outside organizations, pollution, animals.	Examples of risk: adverse weather, illness, hypothermia, assault, getting lost. Is the risk high / medium / low ? My research will be undertaken either indoor or remotely, hence risks associated with the environment will be minimal.

CONTROL MEASURES	**Indicate which procedures are in place to control the identified risk**
	work abroad incorporates Foreign Office advice
X	participants have been trained and given all necessary information
	only accredited centres are used for rural field work
	participants will wear appropriate clothing and footwear for the specified environment
	trained leaders accompany the trip
	refuge is available
	work in outside organisations is subject to their having satisfactory H&S procedures in place
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

EMERGENCIES	Where emergencies may arise use space below to identify and assess any risks
e.g. fire, accidents	Examples of risk: loss of property, loss of life

In case of a fire in my accommodation or the location where I'm working in, the risk is low and there will be adequate measures to respond to such emergency event.

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
	participants have registered with LOCATE at http://www.fco.gov.uk/en/travel-and-living-abroad/
	firefighting equipment is carried on the trip and participants know how to use it
	contact numbers for emergency services are known to all participants
X	participants have means of contacting emergency services
X	participants have been trained and given all necessary information
	a plan for rescue has been formulated, all parties understand the procedure
	the plan for rescue /emergency has a reciprocal element
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

EQUIPMENT	Is equipment used?	NO	If 'No' move to next hazard If 'Yes' use space below to identify and assess any risks
e.g. clothing, outboard motors.	Examples of risk: inappropriate, failure, insufficient training to use or repair, injury. Is the risk high / medium / low ?		

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
	the departmental written Arrangement for equipment is followed
	participants have been provided with any necessary equipment appropriate for the work
	all equipment has been inspected, before issue, by a competent person
	all users have been advised of correct use
	special equipment is only issued to persons trained in its use by a competent person
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

LONE WORKING	Is lone working		If 'No' move to next hazard

	a possibility?	NO	If 'Yes' use space below to identify and assess any risks
e.g. alone or in isolation *lone interviews.*	Examples of risk: difficult to summon help. Is the risk high / medium / low?		

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
	the departmental written Arrangement for lone/out of hours working for field work is followed
	lone or isolated working is not allowed
	location, route and expected time of return of lone workers is logged daily before work commences
	all workers have the means of raising an alarm in the event of an emergency, e.g. phone, flare, whistle
	all workers are fully familiar with emergency procedures
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

ILL HEALTH	The possibility of ill health always represents a safety hazard. Use space below to identify and assess any risks associated with this Hazard.
e.g. accident, illness, personal attack, special personal considerations or vulnerabilities.	Examples of risk: injury, asthma, allergies. Is the risk high / medium / low? There may be the risk of contracting the coronavirus, though the risk is minimal as I will follow social distancing rules set out by the government.

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
	an appropriate number of trained first-aiders and first aid kits are present on the field trip
	all participants have had the necessary inoculations/ carry appropriate prophylactics
	participants have been advised of the physical demands of the trip and are deemed to be physically suited
	participants have been adequate advice on harmful plants, animals and substances they may encounter
	participants who require medication have advised the leader of this and carry sufficient medication for their needs
X	OTHER CONTROL MEASURES: please specify any other control measures you have implemented: I will follow social distancing rules and conduct my research mostly remotely to minimise risk of contracting the virus.

TRANSPORT	Will transport be required	NO		Move to next hazard
		YES	X	Use space below to identify and assess any risks
e.g. hired vehicles	Examples of risk: accidents arising from lack of maintenance, suitability or training Is the risk high / medium / low?			

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk
X	only public transport will be used
	the vehicle will be hired from a reputable supplier
	transport must be properly maintained in compliance with relevant national regulations
	drivers comply with UCL Policy on Drivers http://www.ucl.ac.uk/hr/docs/college_drivers.php
	drivers have been trained and hold the appropriate licence
	there will be more than one driver to prevent driver/operator fatigue, and there will be adequate rest periods
	sufficient spare parts carried to meet foreseeable emergencies
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

DEALING WITH THE PUBLIC	Will people be dealing with public	YES	If 'No' move to next hazard If 'Yes' use space below to identify and assess any

	risks	
e.g. interviews, observing	Examples of risk: personal attack, causing offence, being misinterpreted. Is the risk high / medium / low?	
	There could be the risk of being misinterpreted during interviews, though my interviews are planned to be undertaken remotely through phone or online meeting.	
CONTROL MEASURES	**Indicate which procedures are in place to control the identified risk**	

	all participants are trained in interviewing techniques
	interviews are contracted out to a third party
	advice and support from local groups has been sought
	participants do not wear clothes that might cause offence or attract unwanted attention
X	interviews are conducted at neutral locations or where neither party could be at risk
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

WORKING ON OR	**Will people work on**	**NO**	**If 'No' move to next hazard**
NEAR WATER	**or near water?**		**If 'Yes' use space below to identify and assess any**
			risks
e.g. rivers, marshland, sea.	Examples of risk: drowning, malaria, hepatitis A, parasites. Is the risk high / medium / low?		
CONTROL MEASURES	**Indicate which procedures are in place to control the identified risk**		

	lone working on or near water will not be allowed
	coastguard information is understood; all work takes place outside those times when tides could prove a threat
	all participants are competent swimmers
	participants always wear adequate protective equipment, e.g. buoyancy aids, wellingtons
	boat is operated by a competent person
	all boats are equipped with an alternative means of propulsion e.g. oars
	participants have received any appropriate inoculations
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

MANUAL HANDLING (MH)	Do MH activities take place?	NO	If 'No' move to next hazard If 'Yes' use space below to identify and assess any risks
e.g. lifting, carrying, moving large or heavy equipment, physical unsuitability for the task.	Examples of risk: strain, cuts, broken bones. Is the risk high / medium / low?		

CONTROL MEASURES	Indicate which procedures are in place to control the identified risk

	the departmental written Arrangement for MH is followed
	the supervisor has attended a MH risk assessment course
	all tasks are within reasonable limits, persons physically unsuited to the MH task are prohibited from such activities
	all persons performing MH tasks are adequately trained
	equipment components will be assembled on site
	any MH task outside the competence of staff will be done by contractors
	OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

SUBSTANCES	Will participants work with substances	NO	If 'No' move to next hazard If 'Yes' use space below to identify and assess any risks
e.g. plants, chemical, biohazard, waste	Examples of risk: ill health - poisoning, infection, illness, burns, cuts. Is the risk high / medium / low?		
CONTROL MEASURES	**Indicate which procedures are in place to control the identified risk**		

- [ ] the departmental written Arrangements for dealing with hazardous substances and waste are followed
- [ ] all participants are given information, training and protective equipment for hazardous substances they may encounter
- [ ] participants who have allergies have advised the leader of this and carry sufficient medication for their needs
- [ ] waste is disposed of in a responsible manner
- [ ] suitable containers are provided for hazardous waste
- [ ] OTHER CONTROL MEASURES: please specify any other control measures you have implemented:

OTHER HAZARDS	Have you identified any other hazards?	NO	If 'No' move to next section If 'Yes' use space below to identify and assess any risks
i.e. any other hazards must be noted and assessed here.	Hazard: Risk: is the risk		
CONTROL MEASURES	**Give details of control measures in place to control the identified risks**		

Have you identified any risks that are not adequately controlled?	NO	X	Move to Declaration
	YES		Use space below to identify the risk and what action was taken

Is this project subject to the UCL requirements on the ethics of Non-NHS Human Research?

If yes, please state your Project ID Number

For more information, please refer to: http://ethics.grad.ucl.ac.uk/

DECLARATION	The work will be reassessed whenever there is a significant change and at least annually. Those participating in the work have read the assessment.

Select the appropriate statement:

X	I the undersigned have assessed the activity and associated risks and declare that there is no significant residual risk
X	I the undersigned have assessed the activity and associated risks and declare that the risk will be controlled by the method(s) listed above

NAME OF SUPERVISOR Dr. Susan Moore

FIELDWORK **5** May 2010