

1
2 **The Art of Blurring the Lines: From Passive**
3 **Spectatorship to Activating Immersion for Innovative**
4 **and Inclusive Climate-Neutral and Smart Cities**
5 **Subtitle: Rethinking Approaches to Communication and**
6 **Social Transformation within the Green Transition and**
7 **Smart City Governance**

8 *The paper seeks to clarify the ways in which art could help a smooth Green*
9 *Transition and more open smart city governance that empowers the residents*
10 *with higher agency and two-way communication. Also, it explains place-based*
11 *and art-based methods used as part of the methodology of ongoing research;*
12 *Liveable Neighborhoods as Catalyst for a Green Transition through an*
13 *Interdisciplinary Intervention of Art, Place and Technology. The study explains*
14 *the necessary change in the dynamic of ways to ensure sustainable momentum*
15 *in terms of the Green Transition and authentic people`s involvement in city-*
16 *making, and participation. It offers a deeper insight into ways of exploring and*
17 *reshaping different relationships in and with the smart city as purposeful*
18 *synergy and collaborative intelligence are empowered by place-based and art-*
19 *led methods in this research to make the most out of interactions in the city.*
20 *Different systematic and non-systematic techniques and data collection*
21 *methods were used in searching and filtering resources and literature. The*
22 *paper starts with Sustainability, Pluralism and Restorative Environments, then*
23 *moves to matters of Governing, Imagining, and Understanding the city,*
24 *followed by a debate around Spectatorship, Immersion, and Activation, and*
25 *ends with making the case for Moving towards Reflexivity, Resilience, and*
26 *Pluralism.*

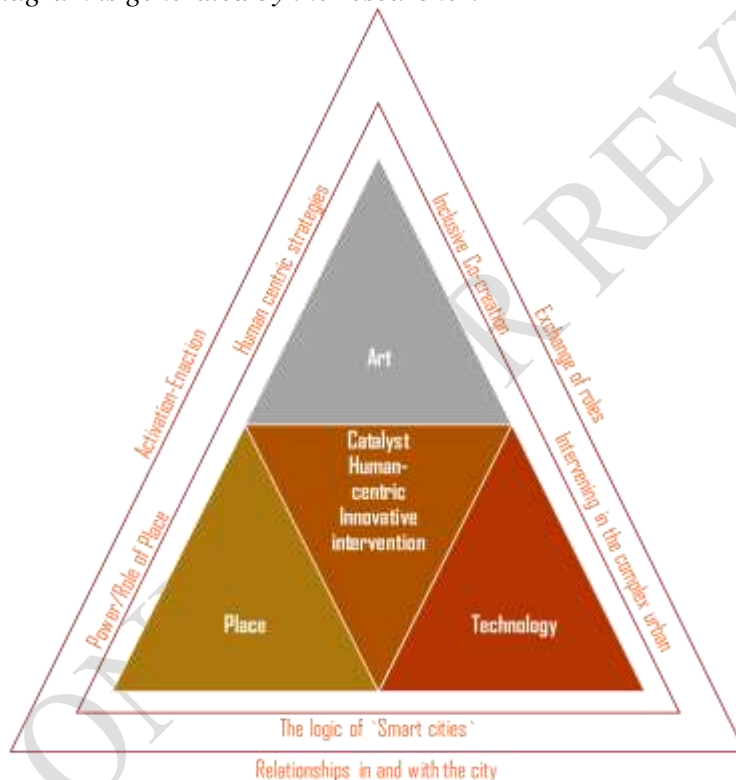
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28 **Keywords:** *Smart Cities, art and smart, smart cities design, smart cities*
29 *making, sustainability, city brain and smart cities metrics, governance,*
30 *planning and policy.*

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32
33 **Introduction**

34
35 This paper stems from a recently published critical literature review
36 “*Making cities smarter for an inclusive green transition towards a long-term*
37 *sustainable development: A critical literature review*” (Hatem, 2023). The
38 publication was part of an ongoing research project at the University of West of
39 England, Liveable Neighborhoods as Catalyst for a Green Transition through an
40 Interdisciplinary Intervention of Art, Place and Technology which explores
41 changing the dynamic of conventional public engagement in city-making and
42 decision-making processes. The project suggests using place-based accessible
43 platform (online and offline) that brings various people in the city together. This
44 is proposed through an artistic activation that stimulates exchange of roles among
45 different stakeholders in the city to result in change in behaviour and attitude
46 toward a more successful, inclusive and engaging green transition.

1 As shown in Figure 1, the approach advances the argument around what
 2 smart cities are and can be to practically focus on human centric methods that
 3 could be used as part of its sustainable development. Integrating art, place and
 4 technology, shifts the focus from activity to activation, from engagement with
 5 only who are already interested in participating to stimulation of all other
 6 categories mapped in this publication. This is a part of the greater focus shift
 7 from notions and empty labels to what can be achieved on the ground by means
 8 of activation and enaction that are capable of shaping and re-shaping various
 9 relationships with and within the city as well as fostering exchange of roles
 10 among different stakeholders. This is suggested to be used as higher leverage
 11 point to better intervene in cities given their complex nature, and to assist a real
 12 and sustainable change in attitude and behaviour among people.

13
 14 **Figure 1.** Using a combination of art, place and technology to empower cities,
 15 diagram is generated by the researcher.



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18 Relying only on problematic city diagramming and existing methods to
 19 involve people in decision making or urban development have been namely
 20 summoned up in calls for public engagement as part of the “bottom-up” versus
 21 “top-down” debate is proven to be insufficient and depend very much, in its
 22 success, on the type and number of the participants among other factors (Hatem,
 23 2023). Meadows (1999) argued that intervening in complex systems such as
 24 cities generates only a little influence if change to the components is undertaken
 25 under the same key players or structures of current systems, making it a lower
 26 leverage point, compared to changing the insight and key players (Hatem, 2023).

1 Meadows (1999) stated that global issues sometimes need a slower,
2 negative, or even no growth. It is crucial to clarify the hidden and often
3 contradictory aspects of these visions. Similarly, Vigar et al. (2005) mention that
4 the concept of the multicultural city which is usually associated only with
5 positive impressions of “cityness” such as “enjoyment” and “creativity” through
6 providing multiple identity resources for residents, may also result in anxiety,
7 tensions, and segregation amongst different groups, “creating deep divides
8 between those with access to ‘smart’ and those without (Datta, 2014; 2015,
9 Luque-Ayala and Marvin, 2015; 2108; Hatem, 2023). A deep insight into ways
10 of intervention in complex systems like cities is needed, because determining
11 leverage points within is hard. Even if they are detected, they are intuitively
12 pushed in the wrong direction causing problems to further deteriorate as they rush
13 towards further growth (Meadows, 1999; Hatem, 2023).

14 The paper starts by introducing arguments around the notion of sustainability
15 and the need for a deeper and common understanding of urban issues including the
16 need for pluralism and restorative environments. Then the topic changes to present
17 an argument for establishing the ability to imagine, express and conceptualize the
18 city in multiple ways in urban policy and planning. After that, the difference
19 between passive spectatorship and immersion is presented including the impact
20 both have, various ways of mapping stakeholders in the city as well as presenting
21 six ways to integrate art in processes of social transformation and handling global
22 issues like climate change. Finally, the need for more fluid, reflexive and resilient
23 cities governance and planning is clarified to enhance the understanding of
24 different aspects and complexities of design and change.

25
26

27 **Methods**

28

29 A combination of systematic and non-systematic data collection methods was
30 used to search, filter and engage with publications and material related to the topic.
31 The paper was informed by workshops and discussions that took place with senior
32 academics and professionals with extensive interest and empirical work in smart
33 cities, climate change and public engagement. The collected material was filtered
34 by searching the summary, introduction and conclusion sections. Various
35 resources were combined to sustain the position of this paper or to stimulate
36 discussion to clarify different angles of the topic. As part of the systematic search
37 and filtering, a snowball development arose in a way that helped secure more
38 resources, links and practical examples. This has led to a deeper understanding of
39 the connections to contribute to a gap in knowledge on integrating art, place-based
40 methods and activation to improve smart cities or realise climate neutrality.

41

42 **Results**

43

44 *Sustainability, Pluralism and Restorative Environments*

45

46 Many studies conducted by scholars such as Browning et al. (2014) and

1 Kellert and Calabrese (2015) Heerwagen and Heerwagen (2017), confirmed that
2 creating and maintaining a sense of place evokes a better attitude and sense of
3 responsibility towards the built environment fostering public participation which
4 is vital to the development of a more liveable smart city. Kellert et al. (2011; 6)
5 stated “this attachment to territory and place remains a major reason why people
6 assume responsibility and long-term care for sustaining buildings and landscapes.
7 Conversely, lacking a sense of place, humans typically behave with indifference
8 toward the built environment” which directly connects the design of urban space
9 to behaviour and accountability of individuals within it.

10 Guy (2011) opposed singular views of urban sustainability holding that
11 further development results from solely improving one aspect of it such as
12 technology or architectural aesthetic. In his view, the development path is rather
13 collective of different architectural representations of the changing relationship
14 between environment and society, through a variety of different philosophies,
15 processes, and practices. This concept rejects the dependency on a one size fit all
16 or a unified approach to sustainability, arguing that the meaning and practice of
17 sustainable architecture is subject to debates between several knowledge
18 societies, including architects, policymakers, and the general public. To better
19 understand the heterogeneity of sustainable strategies, we need to consider
20 different approaches to identifying, defining, communicating, and assessing
21 problems and then materializing them through various design and development
22 paths (Guy and Moore, 2007; Guy, 2011). However, the focus on flexibility does
23 not aim to defend a disordered practice without judgment nor does it necessarily
24 call for an entirely new practice to replace the latter, but rather to create a state of
25 balance to “avoid closing the evaluation process prematurely” (Bijker, 1995;
26 Guy, 2011; 142) by being open to other possibilities and heterogeneous sets of
27 purpose and program without restraining the options with certain types of
28 technology (high or low tech), materials,...etc.

29 Moreover, it is important to understand not only the role that technological
30 innovations play, but also the knowledge as well as the contradictions associated
31 with its manufacture, implementation, and use, to better understand the competed
32 transition approaches. The suggested approach gives a better opportunity to
33 understand the possible rearrangements of what Swyngedouw (2006) referred to
34 as “combined metabolic transformations of socio- natures” (Swyngedouw, 2006,
35 109; Guy, 2011; 142), as it transcends the controversial and ideological debates
36 about sustainable visions, to the often chaotic ways in which architecture takes
37 place in local contexts with funded systems that use specific expertise (or not),
38 connect or disconnect to infrastructure networks, are discussed by a limited (or
39 expanded) user community, put into a planning framework (or not), and so on.
40 Thus, the aim is not to provide a global blueprint, but to find out how can certain
41 combinations that are no longer focused on technological advancements, but also,
42 the knowledge behind, different practices and power dynamics, help address
43 specific challenges in the site through understanding and critically engaging with
44 the involved parties to be able to outline some general principles and priorities
45 that may provide a framework for a “fluid design”, and to create a compelling
46 and applicable toolkit for innovations in design, technologies, and practices (Guy,

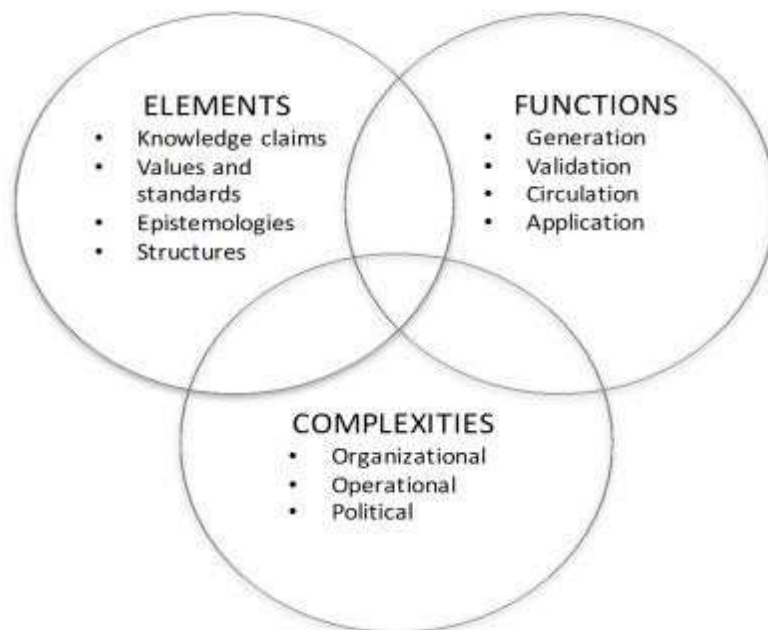
1 2011).

2 According to Muñoz-Erickson et al. (2017), sustainability calls for
 3 innovations that are not limited to how the built infrastructure is designed in cities
 4 but also how their knowledge infrastructures are planned and developed as well,
 5 to establish new ways of thinking. Knowledge systems include the organizational
 6 and routine practices that are used to create, verify, communicate, and apply
 7 knowledge. Knowledge systems analysis shown in (Figure 2), is a framework
 8 that examines both how these practices and routines work and how they interact
 9 with “visions, values, social relationships, and power dynamics” that all play a
 10 role in managing the creation of sustainable cities. Thus, using it as a conceptual
 11 and empirical framework is recommended for scholars and practitioners
 12 interested in designing knowledge co-production opportunities, seeking not only
 13 to produce a better knowledge but also to facilitate the successful implementation
 14 of sustainable long-term results; as it aims to achieve resilience and
 15 transformation potential for cities (Muñoz-Erickson et al., 2017).

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18 **Figure 2.** *Elements of knowledge system analysis after Muñoz-Erickson et al.*
 19 *(2017)*



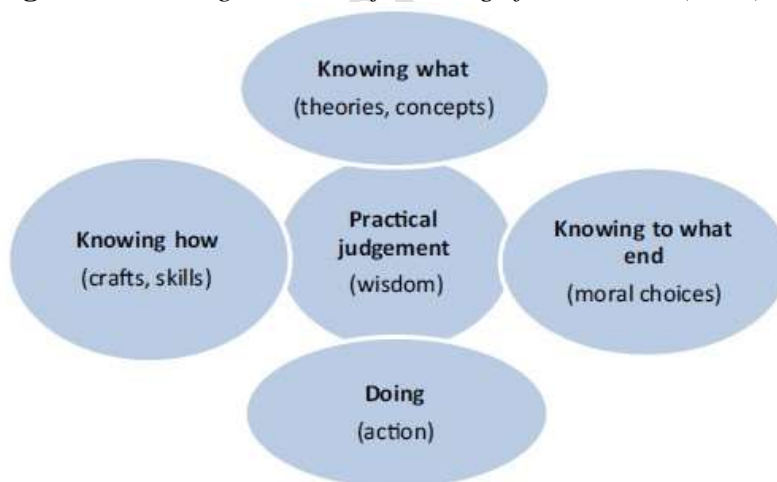
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22 As the term knowledge co-production refers to the interconnected practices
 23 of knowledge production and application, whereby the various actors of science,
 24 practice and politics jointly identify problems, produce knowledge and put it into
 25 practice through cooperation, integration and learning (Cash, 2003; Berkes, 2009;
 26 Hegger et al., 2012; Muñoz-Erickson et al., 2017), it challenges the view that
 27 knowledge production and policy-making take place in silos separate from one
 28 another (Van Kerkhoff, 2006; Vogel, 2007, Muñoz-Erickson et al., 2017).
 29 Therefore, it requires a fundamental shift in knowledge and governance towards

1 more relevant, integrative, reflective, and reflexive practices, calling to upgrade
 2 the scientific foundation of decision-making in a way that brings knowledge
 3 closer to practice, moving towards a broad interaction with a multiple set of
 4 knowledge systems (Miller, 2008; Muñoz-Erickson et al., 2017), instead of
 5 traditional institutional and administrative boundaries that view the relationship
 6 between science and decision making as “a one- or two-way interaction to a more
 7 complex relationship in terms of multiple actors and knowledge, multiple
 8 interactions and multiple mechanisms” (Muñoz-Erickson et al., 2017; 3). At the
 9 same time, reorganizing knowledge requires understanding how urban
 10 management and life operate socially, politically and economically, including the
 11 factors that affect facilitating or limiting the change potential in urban knowledge
 12 systems. Thus, the first critical step at the beginning of seeking the creation and
 13 implementation of new knowledge for urban sustainability and resilience is to
 14 understand the complex ways in which knowledge and governance practices are
 15 intertwined across processes and institutions of the city (Muñoz-Erickson et al.,
 16 2017). This view is also supported by Davoudi`s (2015) “Planning as a practice
 17 of Knowing” which emphasises more multidimensionality, situatedness,
 18 contestation, and dynamism by acknowledging the interconnectedness between
 19 theories, skills, practical wisdom and doing as presented in Figure 3, noting that
 20 theory and practice are relational. The interconnected and ever-changing web of
 21 dynamic relationships between planners and society and their planning concepts
 22 “mediated through forms of representations, systems of rules and relations of
 23 power” where knowledge is no longer an isolated category in itself is essential to
 24 this concept (Davoudi, 2015; 328).

25
 26 **Figure 3.** *Planning as an act of knowing after Davoudi (2015)*



27
 28

29 Based on this feature of plurality of place (i.e. having multiple forces and
 30 processes interrelating) a place-based methodology is recommended for design
 31 researchers as this perception of place can offer a better approach to understanding
 32 its multiplicity by allowing interdisciplinary actors to better locate and perform,
 33 avoiding homogenization (Vanni and Crosby, 2023). Similarly, Snadercock
 34 (2005) emphasised the power of securing inclusive narratives of place to negotiate

1 and mediate perceptions conditioned by lifestyle through different ways such as
2 local storytelling, events and cultural designs or programs, as by making them
3 visible we strengthen social cohesion and provide a new more contemporary basis
4 for transforming the area. Kiib and Marling (2015) asserted the possibility of
5 opening the city visually and physically creating new narratives through new
6 accessibilities and transparent mediums brought by various architectural projects
7 while observing the resulting cityscape changes and cultural exchange while
8 noting who the users were and how they used the site. However, closed and
9 homogenous spaces were mentioned as demarcation areas that did not allow
10 social change or progress openness of the city in new ways as noticed in
11 connecting transition areas (e.g. parks, bridges, edge zones) that are designed in
12 context to form a flow of people and items while creating a framework for
13 exchanging behaviours, cultures and perspectives on social issues across
14 boundaries (Hajer & Rejindorph, 2001; Kiib and Marling, 2015).

15

16

17 **Governing, Imagining, and understanding the City**

18

19 Establishing the capacity to imagine the city in multiple ways in urban policy
20 and planning is necessary to express concepts of “cityness” in spatial strategies in
21 a collaborative way by exploring “local contingencies”, their implied meanings,
22 and implications (Healey, 1997; Vigar et al. 2005). These imaginaries and
23 conceptions are considered highly significant in developing the experience and
24 governance of the city as they were also historically important in land use planning
25 where they are used in the policy field, establishing the spatial planning domain.
26 Discouraging further discussion on what is meant by words like “city” in the
27 domain of spatial planning saves the contemporary governance a lot of trouble by
28 making multiple policy interventions more coordinated and unified while
29 mobilising various actors to turn them into political coalitions (Vigar et al. 2005).
30 The broader understanding of the urban seems also to be obtained from public,
31 cultural and artistic illustrations (e.g. exhibitions, photographs ... etc.) which
32 contribute later on to the city development when applied as a type of art critic that
33 belongs to architectural imagination (Kurg and Shields, 2004). According to
34 Soares (2015), the public imagination of the urban is representing cities in
35 paintings, movies, literature ... etc. Gandy (2014) for example treated modernism
36 through linking various epistemologies (e.g. public discourse, scientific
37 knowledge, and individual creativity) and relying on a more politically directed
38 approach through the use of art, literature, and photography; presenting
39 modernism as a “historic and geographic form of the relationship between water
40 and urban infrastructure” Gandy (2014; 488) to represent the relation between
41 water and modernity and on the emergence of urban infrastructure from debates
42 amongst actors, ideologies and power relations that led to “uneven distribution of
43 resources and environmental hazard related to water” (Gandy, 2014; 1).

44 Miller (2020) is one of the scholars who advocate the principle of integrating
45 both techno-politics and sociotechnical imaginaries while taking smart cities as
46 “empirical focus”. This view is justified with the possibility to approach smart

1 cities as “socio-technical assemblages that are inherently techno-political”
2 (Hommels, 2020; 412) as techno-political agendas are involved in shaping both
3 sustainability and sociotechnical imaginaries. Miller (2020) also confirmed the
4 existence of “tensions between imaginaries at the local, national and international
5 scale” (Miller, 2020; Hommels, 2020, 415) and for STS to consider global techno-
6 politics and local context. This validates the STS perspective on cities as “highly
7 appropriate strategic research sites for studying the complex interactions and
8 tensions between the local, national and global” (Hommels, 2020). However,
9 Healey (2007) discussed the existing strategy-making that aims to “mobilize
10 resources and concepts of place identity” as a political task by seeking to
11 “summon up” (Amin 2002; Healey, 2007) concept of a city or an urban area. As
12 the involved actors are investing in physical projects and making sense of qualities
13 of place, there is a need for new politics that are more fluid and operate with
14 consideration of the dynamic nature of cities as places of social interaction. Also,
15 considering the complex nature of spatiality and “places of cities” as constructions
16 that emerge through the collaboration between various networks helps not to treat
17 the urban regions as “integrated unities with a singular driving dynamic, contained
18 within clearly defined spatial boundaries” (Healey, 2007; 23).

19 It is well established that urban development planning, in the socio-economic
20 and environmental sense, cannot be subject to a linear process “from intention to
21 planning, to action, to outcome” (Healey, 2007; 23) following a governmental
22 intervention in a non- reflexive manner that ends within a certain timeframe. It
23 requires awareness on the part of the participants in spatial strategy-making of the
24 multiple networks of relationships as well as the interplay of the diverse dynamics
25 (i.e. economic, socio-cultural, environmental and political/administrative
26 dynamics) as they develop across and within an urban area transcending the
27 limitations of examining spatial patterns of activities in a two-dimensional map.
28 Within the scope of governance, this means that traditional planners, focusing on
29 qualities of a place, must meet analysts and policymakers specialized in other
30 areas of policy field resulting in rethinking government and governance creatively,
31 seeking a more effective implementation of policy agendas that is more citizens
32 centric and consider demands of “organized stakeholders” (Healey, 2007; 23).
33 Luque-Ayala and Marvin (2015) hold that gaining exposure to these processes will
34 enable us to get to know the current pathways of smart cities and their possible
35 splintering or integrating nature. Also, it will help to inspect the claimed potentials
36 which are primarily generated through technologies that are controlled by logics of
37 politics and administrative methods (Hudson, 2011; Luque-Ayala and Marvin,
38 2015, Marvin and Luque-Ayala, 2017).

39 Science and technology studies (STS) seem to provide a more complex and
40 rather more promising perspective to approach studying cities, presenting them as
41 vital sites to understand socio-technical changes and the interrelations of power
42 dynamics, technology and knowledge (Gieryn, 2006; Hommels, 2020;1). Under
43 the topic of “knowing the city”, scholars like Rob Shields-professor of Sociology
44 and Anthropology at Carleton University, Ottawa-argues that only the materialistic
45 nature of a city is what is represented in maps and official records. There are other
46 intangible aspects bound to cities and the urban as a system that in its performance

1 also depends on other intangible elements that include socio-economic interplay,
2 qualities of standard agreements and structures governing the citizen's behaviour
3 and interaction. Shields explains that it is significant not to approach the city as a
4 merely physical object limited in the scope of charts, maps, and urban
5 characteristics. The concept of a city includes other virtual qualities of the urban
6 with the previously mentioned representations in official documents as it will offer
7 a better sense of what a city is and this would better clarify the ontology of the
8 city, which in its turn brings the field of urban studies into a stronger existence
9 amongst other disciplines. Regarding the distinction between the urban and the
10 rural; Shields argues that both are "a context within which cities develop which are
11 difficult to separate" depending on the virtual nature of the socio-environmental
12 aspect of the urban instead of limiting the notion to be only defined by Euclidean
13 imaginaries (e.g. geological properties represented in maps) (Kurg and Shields,
14 2004) as these representations are not equipped to embrace the diversity of the
15 modern city (Boeri, 1998/99; Vigar et al., 2005; 1407). Limiting words such as
16 city and smart to be recognized with one definition or a single interpretation in the
17 public imaginary might objectify what a city is and would inevitably favour
18 certain places, people, imaginaries (Vigar et al., 2005). Whereas, urban STS
19 scholars can provide the necessary criticism that reveals the sway of imaginaries
20 and positivist science promoting that smart would be always politically neutral and
21 just. This will guarantee more realistic smart cities imageries that state the negative
22 impacts while standing for values that support the participatory process of change
23 and admitting the active nature of the interaction between residents and
24 technologies on day to day basis (Karvonen, 2020).

25 Healey (2007) stated that the urban settings will not have much validity
26 unless the residents' experiences, expectations, and associated meanings of what
27 the daily experience would be like, are met through a "strategic spatial frame of
28 reference" managing urban areas as "imagined places". This strategic
29 imagination succeeds by capturing a multidimensional feeling for the
30 unknowable, multidimensional, emergent 'placeness' of the urban (Healey, 2007;
31 288). The critical understanding these research efforts try to provide to assess the
32 notion from different perspectives is significant; according to a study focused on
33 scientific communication headed by Joanna Hoxster-an environmental scientist at
34 Bucknell University in Pennsylvania- it has been well established that to achieve
35 successful scientific communication; understanding as a means by which novel
36 information is analysed and digested and connections amongst different inputs
37 are made is essential to knowledge as "facts must be weaved, analysed, and
38 contextualized. Linking cause to effect and deciding what to do next only
39 happens when knowledge can be coupled with understanding" (Livni, 2017).

40 As urban techno-politics emphasise the strong interplay between urban and
41 technological developments (Rutherford, 2020; Karvonen,2020), handling cities
42 through an "STS urban lens" in further studies and research efforts are expected
43 to clarify the properties and relations of smart cities in-depth as the research
44 interests amongst scholars in both disciplines complement each other (i.e. how
45 technology and humans influence each other within the city is the main concern
46 of STS scholars and how these STS concepts are meant to expand the capabilities

1 of analysing the implications of the socio-technical systems on urban
 2 development is the focus of urban studies). This combination presents an
 3 opportunity for a broader interpretation of cities “as messy sociotechnical
 4 achievements that are simultaneously discursive, material, temporal, spatial, and
 5 infused with power dynamics” (Karvonen, 2020). To provide knowledge about
 6 cities and analyse how they develop over time, new urban science has been
 7 introduced by urban researchers and promoted by academic research centres
 8 utilizing various means including “big data, ubiquitous sensing, geospatial and
 9 social network analyses, algorithms, machine learning, and artificial intelligence
 10 ... multiple urban observatories, control centres, and knowledge platforms”
 11 (Miller, 2019; Karvonen, 2020; 418). By investigating knowledge production
 12 processes which fall under the influence of “implicit political assumptions about
 13 how we know the city and how we apply this knowledge in various ways”
 14 (Karvonen, 2020; 419) urban STS scholars can inspect the way with which the
 15 knowledge is produced and legislated and by whom it is arranged. They can
 16 also examine how this knowledge might advise decision making processes and
 17 democratize modes of knowledge generation (e.g. replacing top-down with
 18 bottom-up approach) and suggest alternatives, which leads to a closer look at the
 19 power dynamics of the process to consider the parties included and the
 20 involvement of their expertise. This will illustrate how knowledge is processed
 21 and applied elsewhere through urban techno-politics.

22

23 *Spectatorship, Immersion and Activation*

24

25 Meadows (1999) stated that intervening in complex systems such as cities
 26 needs a higher leverage points as little influence is caused if change is undertaken
 27 under the same key players or structures of current systems. As such high leverage
 28 can be secured by changing the insight and key players (Hatem, 2023), the study
 29 adopts a theatre-inspired argument established by Reason (2019) which suggests
 30 that a traditional theatre can change into a more engaging and immersive one,
 31 when techniques were used to exchange the roles among audience and performer.
 32 This has also resulted in a different and deeper insight than just being a passive
 33 spectator. Such capability adopts a concept of immersion as involvement has
 34 proven possible in immersive theatre where the spectator`s role has changed to the
 35 performer and vice versa making it more effective and engaging while providing
 36 instant delivery of the message as well as response from the audience (Kolesch et.
 37 al., 2019). The paper suggests that a similar argument could be made if we start
 38 adopting this approach to immersive participation to secure different feedback
 39 loops among various participates and stakeholders in two way communication,
 40 replacing top down and bottom up approaches. Hence, the study was inspired by
 41 the level engagement and quality of feedback secured by immersion through
 42 provocations that stimulated active participation and roles exchange. Also, this
 43 evidently will help to design engaging ways and places to motivate various people
 44 in the city towards undertaking change, participation and responsibility.

45 Weinberger et.al. (2021) confirmed that spaces can be used to motivate and
 46 activate people given their sensory characteristics:

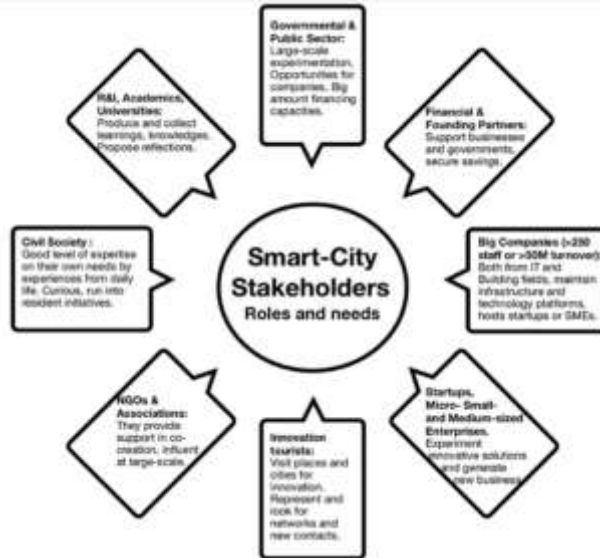
1
2 “In the case of architectural or environmental aesthetics specifically, sensory
3 features of an environment instantiate interest and a desire to explore or approach a
4 given space (i.e., behavioral-motivational responses; Coburn et al., 2017). This link is
5 consistent with longstanding accounts in cognitive science that postulate associations
6 between perception and motivation (Day, 1967) and attention (James, 1985; Kaplan,
7 1995; Reber et al., 2004), as well as perspectives from environmental
8 psychology that propose that evolutionarily-beneficial environments automatically
9 capture human interest (Bowler et al., 2010; Joye, 2007; Ulrich, 1993). Specific
10 visual properties of the environment elicit activation of temporal lobe regions
11 sensitive to visual motion (Vartanian et al., 2015) and the globus pallidus, a brain
12 structure responsible for regulating voluntary movement (Vartanian et al., 2013),
13 further evidence for this association between environmental visual features and
14 behavioral-motivational responses”.

15
16 Therefore, study advocates a place-based approach to be employed,
17 enhancing the city’s capacity to activate improves the green transition potential
18 (i.e. transition from a carbon-based to a more environmental and sustainable
19 economy/industry/development) of existing neighborhoods to become more
20 restorative (i.e. healthy, resilient and engaging) (Roe and McCay, 2021), as part of
21 their climate action aiming for greenhouse gas reduction (mitigation), adaptation,
22 resilience building, and engagement. This parallels with the need for action from
23 governments, cities, regions, businesses, and investors for an effective
24 implementation of the Paris Agreement which formally acknowledges the urgent
25 need to maximise the global response to climate change, prompting governments
26 to be even more ambitious. Governments agreed on the urgent need to mobilize
27 stronger and more ambitious climate action to achieve the goals of the Paris
28 Agreement at the United Nations climate change conference (UNFCCC, 2023).
29 The restorative framework focuses on using attributes and contexts of a city to
30 ensure psychological resilience and healthy behaviours. In this model, place-
31 making, interactivity and varied experiences on the scale of neighbourhood and
32 the city play a role to provide social connections and maintain mental health. This
33 resonates with WHO (World Health Organisation) recommendation to prioritise
34 health and equity in governance and planning (WHO, 2016; Row and McCay,
35 2021) as well as the United Nation’s Sustainable Development Goal 11; to provide
36 cities that are safe, inclusive, resilient and sustainable by 2030 (UN, 2016b). This
37 also stems from its agenda to secure healthy living and wellbeing for everyone
38 through different ages and stages of life for a more sustainable future urban
39 development (UN, 2016a; UN-Habitat and WHO, 2020). This advocates the
40 meaning of place as a dynamic construction that includes not only the physical
41 structure or local history but also the flow of people and their insights due to the
42 plural nature of place as owned by various actors and stakeholders. (Kiib and
43 Marling, 2015).

44

1 *Mapping Roles in the City and Exchange of Roles*

2

3 **Figure 2.** *Mapping Stakeholders in the Smart City, Figure after Carbonnell*
4 *(2019) "SMART-CITY: Stakeholders Roles and needs." 2019, medium.com*

5

6

7 There are various ways of mapping stakeholders in the smart city, but often
8 they relate to basic classification of their sector (e.g. public, private, civil society
9 ...etc) as shown in Figure 2. Whereas actors in policy making are the people who
10 create, implement and enforce laws and policies (e.g. government officials, interest
11 groups, or the public), stakeholders are those who are affected by what is created
12 including individuals, companies or interest groups. Public value creation aspect is
13 related to co-design, leading to a sense of shared responsibility and ownership.
14 High participation rates can lead to high-quality governance that would enable a
15 harmonious development process in the context of sustainability and community
16 life. In addition, new approaches to sustainable development emphasize the role of
17 building relationships with stakeholders and, as appropriate tools, the way in
18 which stakeholders can be involved in the development and recommend methods
19 based on demand and opportunities while stimulating innovative ideas in all
20 aspects of spatial economics (Vitálišová et. al., 2021). Hence, we suggested a new
21 mapping that goes beyond the sectorial divisions in Figure 2 to be grouped under
22 certain ways of looking at the city or taking interest in it as shown in Figure 3. The
23 new map highlighted five key perspectives of positions towards the city and its
24 making which include rolling out of policies, motivations towards change as in
25 various social catalyst professional, bodies and groups, investigating and
26 rethinking the city, financial and innovation investments or efforts and being
27 affected by whatever happens in the city which is under the Affectee category. The
28 latest could apply to any of the preceding categories depending on the placement
29 of the stakeholder. For instance, one can be a policy maker but this does not
30 mean that will not be affected by it. On the other hand, a resident who is not taking
31 part in any of the categories, is namely being passive or remains affected by

1 change or actions around him/her.

2

3 **Figure 3.** Other suggested ways of mapping stakeholders in the city according to
4 their perspective/interest in preparation of exchange of roles, diagram is
5 generated by the researcher



6

7

8 **Figure 4.** Overlooked categories of people in the city according to their position/
9 attitude towards participation/public engagement, diagram is generated by the
10 researcher



11

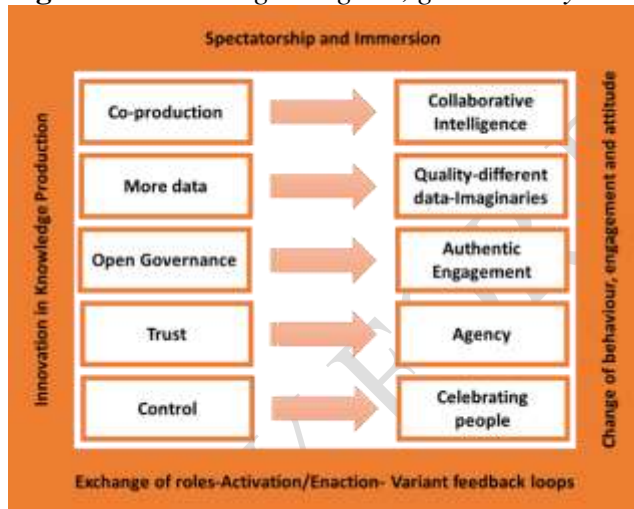
1 Existing top-down and bottom-up approaches of governance are limited in
2 effectiveness and capacity to capture the complexity of urban environments
3 (Luque-Ayala and Marvin, 2015; Sarkar, 2017; Karvonen et al., 2019, Karvonen
4 et al., 2020). The conventional ways of bottom-up engagement is not enough, they
5 seem to engage with those who are readily interested in and have time for
6 participation in indoor meetings and surveys, however there are many other
7 categories as shown in Figure 4. Thus, we need to boost the ability not only
8 capture this complexity but also to assess and deliver effective solutions in relation
9 to the urban policy goals. According to Leeds Climate Commission, difficulties
10 include maintaining momentum as they address some key challenges that are
11 preventing work at the scale and pace required. Also, the biggest challenge was
12 keeping people engaged while face-to-face meetings or events could not take place
13 during the pandemic (Leeds Climate Commission, 2023). As there are other
14 overlooked categories of potential, challenged or demotivated participants, another
15 map resulted from looking differently at the people in the city to explore their
16 attitude towards the city, which is shown in Figure 4.

17 The Place Based Climate Action Network (PCAN) is focused on achieving
18 transformative change on the ground by turning climate policy into action. Climate
19 committees are city or district partnerships that bring together people and
20 organizations from the public, private and civil society sectors who work together
21 to promote, guide, support and monitor climate action. Commissions are
22 independent bodies that complement and expand the activities of local
23 governments, combined agencies and local business partnerships, and build an
24 area's capacity to ensure climate resilience and a transition to a low-carbon
25 economy. Inspired by the Leeds model, new climate commissions were set up as
26 part of the Place-Based Climate Action Network (PCAN), which started in
27 January 2019. The ESRC-funded network aims to help the UK meet the
28 requirements of the 2015 Paris Climate Agreement and the UK Climate Change
29 Act by building local potentials and capacities as well as encouraging the flow of
30 green finance in different cities in the UK. New climate commissions were
31 established in January 2020 in Belfast and February 2020 in Edinburgh. PCAN
32 aims to develop a reproducible model for other locations to set up their own
33 climate commissions, and more are being set up independently of PCAN but
34 supported by PCAN (PCAN, 2023). Nevertheless, issues related to achieving
35 green transition clearly depend on sustaining and developing the current built
36 environment and its social human aspect/factor which requires improving the level
37 of engagement, care/knowledge about the cause and responsibility towards the
38 surrounding environment.

39 As shown in the change model illustrated in Figure 5, such results require
40 certain changes through innovative catalyst methods for change while working
41 collaboratively and not in silos. This also means to innovate ways of collaborative
42 intelligence as people engage with various elements of the city including
43 technology as part of authentic exploration of people's understanding and
44 imaginaries of their city. By giving them the chance to express their impressions,
45 reflections and visions, a higher level of agency is offered as well as potential to
46 cause change and not only just reflect on or react to change around them. In

1 addition, as people interact with technology this way, it becomes easier to explore
 2 and reshape their relationship and other relationships among elements of the city
 3 through artistic means supported with accessible and appealing tools. This
 4 approach celebrates various people, relations, and elements of cities innovatively,
 5 which is necessary to achieve smart cities that are not only more sustainable but
 6 also more liveable and resilient. As part of study, integrating art, place and
 7 technology is proposed as part of a two-way approach that uses the heterogeneous
 8 places/transition areas to implement an atmospheric place-based methodology.
 9 This brings different people and elements together in a way that redesigns and
 10 make their interactions more visible in the city, bringing it to life and adding to its
 11 resilience. This approach enriches the city in many ways by boosting its ability to
 12 evoke and use inclusive narratives, affective atmospheres and sense of place, This
 13 is done purposefully to ensure attachment and belonging as well as multi-influence
 14 spheres on a wide range of people as well as the city's life, resilience and image or
 15 atmosphere.

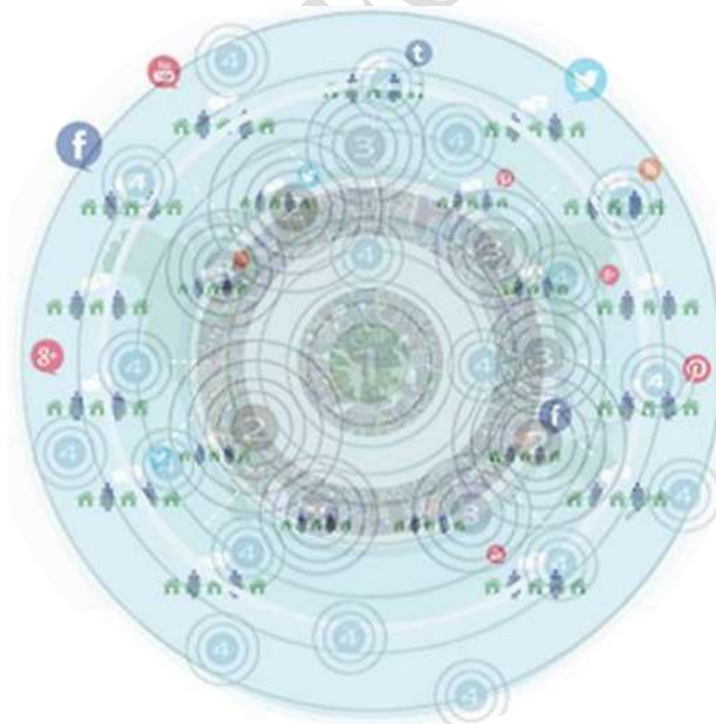
16
 17 **Figure 5.** *The Change Diagram, generated by the Researcher*



18
 19
 20 Stakeholder involvement can strengthen their position and give them a
 21 stronger voice in local politics or give people agency in the city in clearer and
 22 more visible ways. As shown in Figure 5, the study suggests to redesigns
 23 communication and interaction in and with the city (i.e. between various people,
 24 technology and built environment) to motivate and support during their transition
 25 and promote more sustainable decisions, behaviors and learning by using an
 26 accessible (engaging) place-based structure/elements. This could mean that they
 27 are located in a certain area in the city to capture the needs and insights of different
 28 local people and plurality of that place) that is varied over time or in context and
 29 showcases different provocations (e.g. artistic). By using provocations to exchange
 30 various roles in the city; things that stimulates and invites learning, interest,
 31 creativity and reflection, more opportunities to contribute, learn and interact are
 32 made more available on the ground being accessible to different people as part of
 33 their daily physical interactions with elements of the city. This helps to inspire an
 34 appreciation for the role of rich interactions and narratives design between people,

1 technology and the city in a way that imitates the interactive engagement found in
 2 some forms of relational art or participatory experiences which focus on
 3 addressing perception of the audience and providing a sense of place and
 4 atmosphere (i.e. ambience or mood of a place) that fosters higher attachment,
 5 responsibility and belonging among people audience (Kiib and Marling, 2015;
 6 Pallasma, J., 2017 Koelsch et. al., 2019; Roe and McCay, 2021). This targets
 7 various actors, stakeholders and interests as it locates itself in a public area where
 8 the flow of different people and diverse insights in city are more likely to exist,
 9 instead of conventional limited settings of engagement accessible to certain people
 10 (e.g. surveys, indoor meetings...etc.). The areas in which the implementation takes
 11 place is recommended to be heterogenous (e.g. Edge/In between/Transition areas)
 12 to maximize inclusion (Kiib and Marling, 2015). This is implemented as part of an
 13 innovative two-way communication approach where a constellation of various
 14 stakeholders and interdisciplinary skills co-design participatory interests and
 15 interactions that provide meaningful ways of communication that aligns more with
 16 their experiential needs and to facilitate sustainable growth, connecting the local
 17 with the global while building and maintaining momentum during the climate
 18 crisis. This resonates with the need for an innovative place-based climate action
 19 commission in more cities, like Bristol, to maintain momentum and keeps people
 20 engaged with the green transition while it enriches the city in many ways by
 21 boosting its ability to evoke and use inclusive narratives, affective atmospheres or
 22 sense of place (i.e. sensations that affects people`s impression, attachment and
 23 attitude).

24 **Figure 6.** *Multi-ripple Effect, Stimulation and Activation on Various Scales,*
 25 *Diagram is generated by the Researcher*
 26



27

1 By capturing the complexity of urban and human natures and needs this helps
 2 to enrich the current approaches of identifying, defining, communicating, and
 3 assessing problems and then materializing them through various design,
 4 governance and development paths (e.g. top-down, or bottom-up) (Guy and
 5 Moore, 2007; Guy, 2011; Luque-Ayala and Marvin, 2015; Karvonen et al.,
 6 2019, Karvonen et al., 2020). The suggested place based approach is focused on
 7 providing a practical tool to engage everyone including stakeholders/policy
 8 makers and not only the residents. Therefore, the project also explores whether this
 9 combination/tool can also change the roles of the different parties in the city at
 10 certain points to make them more involved instead of being passive watchers or
 11 spectators due to the nature of their existing roles or interests and in turn motivate
 12 them to act. As part of a structure, tool or provocation that is located in the open
 13 spaces of the city (i.e. place-based), a multi ripple-like effect is introduced as
 14 people are anticipated to also become facilitators of this inclusive change as they
 15 contact and impact each other, stakeholders, and systems in real and virtual
 16 realities. As shown in Figure 6. The effect and impact achieved can be on different
 17 scales defined by various zones on the chart. The first zone identified the noticed
 18 impact on direct observers immediately, whereas the second shows others who can
 19 see those involved in the real world. Those who are invited or affected in the
 20 virtual world and various online and accessible platforms are represented in zone
 21 3. Finally wider level of communication and inspiration to various parts of the
 22 world is expressed in zone 4, which also related to boosting justice and access to
 23 this knowledge on the scale of the globe. This in turn can create different levels of
 24 influence where other people, organizations, and interest groups can be inspired to
 25 explore, act and advocate for the cause/debate. The influence caused also includes
 26 evoking an atmosphere or sense of community, interrelation and diversity that
 27 makes the city's intangible aspects deliberately visible, utilized and engaging.

28
 29 *Stimulation through art provocations: Six identified ways to integrate art in the*
 30 *green transition process*

31
 32 The following section presents six different ways that were identified through
 33 investigation of art mediation that was used particularly to make a case for
 34 sustainability, climate change and call for actions This evidently clarifies how art
 35 could be integrated to mediate transformation, conversation and exchange of ideas
 36 as proposed to be part of the green transition. The investigation focused on the city
 37 of Bristol; the largest city in the southwest of England, the European Green Capital
 38 for 2015, the UK's official first cycling city and the UK's official first cycling city.

39
 40 Dynamic Display and Artistic Translation

41 Cabot Conversations is the exhibition in which artworks on climate change
 42 were created, as ten artists were invited to respond translating conversations about
 43 climate change by using different means of art. The conversations and the
 44 artworks can still be observed in action online. Each of the ten artists adapted to
 45 each talk, interpreting talks of two experts from different disciplines, from the
 46 Cabot Institute for the Environment and beyond. The topics discussed were variant

1 including Climate Emergency Power of People, Heatwaves and Health, Net Zero,
2 Earthquakes and the Environment, Water, Ocean Floor, Ecosystem Services,
3 Resilient Cities, and Climate Justice (see more in Cabot Conversations on the
4 University of Bristol website).

5 6 Showcase, Awareness, and Discussion

7 A more direct contact with the artists participating in Cabot Conversations
8 was offered as part of the Bristol SU's Climate Emergency Day of Action. The
9 event invited people to meet with five artists while showing the artworks created
10 in response to climate change talks and exchange perspectives around both the
11 global issue and the interpretation. Additionally, the invitation encouraged
12 networking and discussion on prospective collaboration with participating artists
13 and exploring their reflection and feedback on their experiences interpreting
14 environmental research through art and provided space for contemplation while
15 viewing the artworks.

16 17 Communication-sharing people`s views to inspire thinking about the future

18 Twenty drawings were crafted by a Bristol-based illustrator and designer
19 crafted to be presented in the UN's COP27 summit held in Egypt. The art project
20 communicated people's opinions on climate change and messages they wish to
21 send to decision makers.

22 Also, the artist was appointed by the University of Bristol's Cabot Institute for the
23 Environment to draw on feedback that came from those who visited areas open to
24 the public at COP26 in Glasgow (Pritchard-Jones, 2022).

25 26 Facilitating confrontational conversations and raising awareness to stop unknown 27 dangerous practices

28 A new mural located on St Mark's Road in Easton, Bristol was designed by
29 the Peace Arts Group to draw attention to dangerous air pollution in their area.

30 The artwork was the latest work of the group and one of 17 climate change-
31 inspired art pieces led by Towards 2030, What Are You Doing? and Vanguard,
32 who also delivered the exhibition Bristol Street Art: The Evolution of the Global
33 Movement at Mshed.

34 The new mural was the outcome of collaboration between Peace of Art
35 (consisting of Emily Richards, Aumairah Hassan, Safina Khan and Manazzar
36 Siddique) and community-led project Saaf Hava, run by Residents Against Dirty
37 Energy (RADE) and Council of Bristol Mosques. The group was concerned with
38 wood stoves as a real problem in parts of Easton, particularly given that burning
39 fuels such as wood causes serious harm to the lungs and heart and produces small
40 particles called PM 2.5.

41 Therefor, the artwork helped to raise people`s awareness of the consequences
42 of their actions and fight associated stereotypes; Mrs Hassan said: "*When people
43 think about air pollution they think about cars, trucks and buses whereas in the
44 locality of where the mural is actually being painted there is a real issue of PM
45 2.5....wood burning stoves in particular were an uncomfortable conversation*".

46 Moreover, as the conversation was mediated through this kind of art so that

1 the delivery of the message was ensured to be less confrontational than without as
2 expressed by the Mrs Hussain; *"It's trying to, excuse the pun, but ignite that*
3 *conversation without offending people because I think a lot of people who have*
4 *wood burning stoves don't really understand the implications"*(see more in Bristol
5 art group reveal climate change-inspired mural-BBC News, 2021).

6
7 Restoring mental health and give strength to the climate movement

8 A Climate Poetry Workshop was created by a Bristol based activist, with the
9 aim of providing a safe space to establish, discuss and support better mental health
10 while backing the climate movement. This stems from the need to overcome
11 issues like eco-anxiety which might not be known to everybody and yet they
12 could be affected by. Having such restorative methods helps to maintain
13 momentum and provide safe and sustainable pathways of change.

14
15 Providing answers on how a global issue affects us directly

16 HighWaterLine Bristol is a community-led chalk marking to mark the flood
17 line in Bristol and Avon. Various community groups took part in workshops on
18 climate change and flood resilience, as part of their commitment to artist Eve
19 Mosher's public show in September 2014.

20 Each group handed the sport chalk to another connecting different
21 neighbourhoods and parts of the city while showing the high-water mark that
22 scientists have identified for future flooding in Bristol (see more in High Water
23 Line – Visualising Climate Change, 2014). Such art led activities and hands on
24 experiences alongside like-minded people in the city creates synergy for climate
25 action and not only communication or awareness of the issue. Also, they make it
26 possible for people who observe the line expressing to know the possible danger
27 directly affecting their city and livelihood because of climate change.

28
29 *Moving towards reflexivity, resilience, and pluralism*

30
31 Luque-Ayala and Marvin (2015) stated three priorities and challenges for
32 future research in the field of smart urbanism, emphasising the urgent need for a
33 dialogue about the multiple ways in which smart urbanism is imagined and
34 legislated across different urban contexts to provide a systematic comparison. The
35 priorities start with a focus on the further development of methods of theorizing
36 and visualizing smart urbanism. It is necessary to examine the development of
37 subjectivities that serve the neoliberal city to reveal the political aspect of smart. A
38 creative combination of theoretical frameworks is needed to illustrate how
39 knowledge in smart is built up by specific contexts with a particular historical
40 background and are conveyed through certain organizations and power relations.
41 These frameworks help to understand the mutual relations between innovations,
42 socio-technology, profit, ecological and power dynamics as well as social justice,
43 and how digital innovations are being utilized to repeatedly “unbundle and re-
44 bundle users, space, services and networks” (Luque-Ayala and Marvin, 2015;
45 2112).

46 Another priority is to examine the normative nature of smart urbanization

1 highlighting the possibility of generating alternative concepts and understandings
2 of the city while exploring the objectives of smart urbanism by examining its
3 standards and the possibility of producing alternatives. The alternative responses
4 need to be more diverse, inclusive, user- or demand- centred, and focused on a
5 wider range of social and environmental priorities with more informal social
6 structures. It is also necessary to investigate how they differ from the dominant
7 approaches, they use similar technologies, mechanisms and thinking rationalities
8 that can be hard to distinguish. Also, binary logics do not apply to smart urbanism
9 practices as it comes in many various forms in practice, so practically, the
10 concepts of top-down and bottom-up are not sufficient to reveal the complexity of
11 the situation. Thus, there is a need to critically examine these approaches to state
12 challenges, risks, and potentials of maintaining informal alternatives of smart
13 urbanism, while questioning the rationality that leads to their emergence instead of
14 idealizing them. In opposition to “bottom-up” approaches, governance strategies
15 through smart citizenship are open, experiential, and adjustable where citizens
16 may reject or reverse them and possibly redirect them through other forms of
17 urbanization. To meet their interests, companies and municipalities make smart
18 citizens subject to “individualized and marketized social relations”. In the
19 meanwhile, some forms of smart urbanisation are being introduced by a large
20 number of widely distributed and separate initiatives led by communities, ad hoc
21 volunteer groups and local institutions, among many examples of this;

22
23 “the rise and fall of amateur Wi-Fi networks providing free Internet access (Powell,
24 2011), community organisations using big data ‘to build an economy of information
25 more open to civic intervention’ (Couldry and Powell, 2014: 1), attempts to bypass
26 traditional commercial digital connectivity through user- generated fixed-line
27 broadband (Middleton and Bryne, 2011) and the informal establishment of digital
28 sensors in urban infrastructure towards civic uses (Shepard, 2014)?”.(Luque-Ayala
29 and Marvin, 2015; 2112)

30
31 Finally, to promote a comparative approach to smart urbanism practices
32 examining the differences and contradictions of smart logics and perspectives to
33 their interplay broadly across geographies and scales within a context. In addition,
34 the comparison would give a chance to inspect the possibility of creating
35 alternatives of knowledge and understanding of the different interrelations that are
36 more critical and “contested”. Whereas the dominant logic of smart is meant to
37 examine the development of smart subjectivities that resonates with the needs of
38 the neo-liberal city, it is important to understand that it is a complex and non-linear
39 process. Neoliberalism in practice is “far from uniform in time and space, and
40 varies in its responses through hybrid formations that are clearly conditioned by
41 geopolitics as much as particular local contexts and existing urban” (Luque-Ayala
42 and Marvin, 2015; 2113).

43 One of the examples of structuring alternative responses to complex problems
44 is the suggestion by Geels et al. (2015) to introduce the reconfiguration position as
45 a third position to complement the existing two positions; the reformist and the
46 revolutionary that frame the SCP (sustainable consumption and production)
47 research. The reformist position representing the political and academic doctrine

1 focuses on companies seeking environmentally friendly innovations for consumers
2 and buying environmentally efficient products. However, the revolutionary
3 position radically criticizes the dominant "capitalism, materialism, and
4 consumption" and promotes thrift, economy, and localism. The three positions
5 were not meant to be presented as "absolutist categories" as theories suggesting
6 shades of grey were also discussed in the critical appraisal. Furthermore, their
7 manifestations in the real world can "exist simultaneously and interact
8 dynamically" (Geels et al., 2015; 9). By considering new conceptual frameworks
9 while focusing on changes in socio-technical systems and practical daily activities,
10 the reconfiguration position aims to reduce the dichotomy among both positions as
11 they critically respond to each other which results in "politically conservative
12 outcomes" as policymakers are more likely to choose the reformist approach if a
13 revolution is the only option left. SCP benefits from the ambiguity of different
14 interpretations of its concept by collecting different scholars and actors,
15 highlighting that the SCP agenda played an important role in contributing to and
16 contradicting the economic and technological over-optimism in green and eco-
17 friendly innovations. Similar to the smart cities literature, the reconfiguration
18 position would need more interdisciplinary cooperation and critical innovative
19 attempts, for example, critically rethinking capitalism, the gap between nature and
20 culture, and the definition of social and political issues related to the discourses
21 (Shove, 2010; Geels et al., 2015). Also, the unit of analysis needs interdisciplinarity
22 rather than concentrating on particular actors (e.g. firms, consumers and politicians)
23 (Geels et al., 2015).

24 Nevertheless, Luque-Ayala and Marvin (2015) highlighted three challenges
25 to overcome. Firstly, the development of an interdisciplinary conceptual approach
26 to analyse smart urbanism. This means examining how smart is currently being
27 perceived in sciences while identifying areas of agreement, dialogue, and
28 opposition, to develop conceptions of smart. Secondly, to assess the social and
29 political consequences associated with applying smart logics both materially and
30 discursively; analysing how particular urban scenarios reinforce and restrict smart
31 urbanism transitions and participate in the production of alternative trajectories.
32 Finally, to produce new knowledge comparing the forms, processes, and
33 implications of smart urbanisation internationally. As the current research on smart
34 is still in progress, limited to specific disciplines and individual cases, while cities
35 function actively in different ways complicating, enabling, resisting and translating
36 smart urbanisation, which indicates a lack of comparative studies about the set of
37 urban contexts in which smart arises (Luque-Ayala and Marvin, 2015).

38 According to Degen et al. (2008), studies on the city require multiple
39 theoretics and methodologies (Borden et al., 2001; Dovey, 1989; Degen et al.,
40 2008). Also, there is a need for different approaches to thinking about urban
41 aesthetics as well as other critical tools and more accurate critical vocabulary (see
42 also Goss, 1999; Julier, 2006; Degen et al., 2008). This will enable researchers to
43 better engage with the debate rather than adding to the dominant critics on the
44 "banality" of contemporary urban designs which are often exposed by "the rush to
45 theoretical order" (Amin and Thrift, 2002;3, Degen et al., 2008; 1917) that is
46 proven to be inconsistent with the complexities of urban visualities. Many

1 scholars-Karvonen et al. (2019), Karvonen et al. (2020), Luque-Ayala and Marvin
2 (2015) among others-agree that the research on smart cities is still in its infancy
3 and further critical understanding of the concepts, implications, and potentials that
4 are associated with the promotion of smart cities, is needed (Karvonen et al.,
5 2020).

6 As the literature concentrates on technical, engineering and economic aspects
7 of smart while ignoring the social and political aspects, a critical, interdisciplinary
8 and comparative approach in research on the international level is significant for
9 an accurate understanding of how urban imaginaries and knowledge on smart are
10 being established. Also, the socio-technical and political implications require
11 deeper insight and empirical efforts (Luque-Ayala and Marvin, 2015), to allow
12 understanding how and why smart is being interpreted as another opportunity to
13 reinforce “dominant circuits of capital and a neoliberal governmentality (Vanolo,
14 2013) or as a new governmental form altogether (Gabrys, 2014)” (Luque-Ayala
15 and Marvin, 2015; 2018) across different urban contexts. In their analysis of the
16 smart city standard of the British Standards Institution, Joss et al. (2017)
17 concluded that there is a need for a standard that deals more explicitly with the
18 three analytical dimensions of citizenship regime; “the (envisaged) responsibility
19 relationship between the individual, the community, the market, and the state; the
20 rights and duties establishing the boundaries of political community; and
21 governing practices, including modes of citizen engagement”(Joss et al., 2017;
22 43), in particular, to further clarify the nature of the citizens' agency and to deal
23 more clearly with pluralistic, advisory decision-making processes. The study also
24 emphasizes the need for additional investigation to address the potential of
25 applying the standard to cause a significant shift in local citizenship practices, or
26 whether the local practices mitigate or even eliminate the citizenship system
27 published by the standard, to explore and further develop a practically efficient
28 citizenship system while highlighting the emerging governance relationship
29 between the standard as a national agency and local actors in urban development.
30 Thus, new and critical thinking on the part of both governance professionals and
31 political theorists is necessary too because the concept of citizenship may be
32 rapidly changing that it can no longer be embraced by the current models (Joss et
33 al., 2017).

34 While urban governance experts are aware of the significance of diverse
35 knowledge or experience in looking for and developing sustainable city policies
36 (Petts et al.,2006; Evans et al., 2006; Muñoz-Erickson et al., 2017), they may lack
37 the crucial analysis of power dynamics related to institutional expertise and
38 practices that constitute knowledge production, how are cities imagined and
39 whether there are opportunities for rethinking or redesigning the relations between
40 knowledge and action (Muñoz-Erickson et al., 2017). The knowledge systems
41 analysis presented by Muñoz-Erickson et al. (2017) (Figure 1), provides a way to
42 evaluate how co- production processes of existing and new knowledge perform
43 over time by understanding the current institutional conditions and building
44 reflectivity and transformation through their long- term application. Therefore, it is
45 also recommended as a way to develop the necessary assessment of how co-
46 production processes work for cities and resources (e.g. water, energy, etc.),

1 thereby providing an opportunity to test design proposals in multiple sustainability
2 contexts and organisational structures while allowing for new insights into
3 agreements and processes to attract the most beneficial actors in addressing urban
4 sustainability problems.

5 A critical basis for the term "co-production" that informs this framework is
6 approaching knowledge as "a claim or an idea or belief that someone, whether an
7 individual or a community, takes to be true, or at least relatively more true than
8 other kinds of statements, and therefore of sufficient merit to guide his, her, or
9 their reasoning or, especially for our purposes here, action" (Muñoz-Erickson et
10 al., 2017;6) which comes from a sociological view that recognizes the complex
11 judgments, concepts, frameworks, implicit skills and values that make up
12 knowledge, instead of seeing them as mere simple statements of truth. Dynamic
13 social processes participate in knowledge-making, so that it is the result of
14 articulation, deliberation, negotiation, and valuation of specific epistemological
15 claims, highlighting the important epistemic claims and how they are built,
16 assessed, discussed, and approved as knowledge (Shapin,1994; Muñoz- Erickson
17 et al., 2017).

18 Building trust and a common understanding of the goals amongst researchers
19 and concerned parties is essential to the process (Clark et al., 2016; Muñoz-
20 Erickson et al., 2017). Working with a diverse group of relevant actors with
21 different skills and resources across project components, including formulating
22 and determining knowledge needs and questions, is also critical to productivity
23 (Reyers et al., 2015; Muñoz-Erickson et al., 2017) These practices and an open,
24 thoughtful and transparent framework that fosters mutual social learning are as
25 important as the project's specific outcomes (Fazey et al.,2013; Muñoz-Erickson et
26 al., 2017). Nevertheless, these different concepts of co-production of knowledge
27 also showed that the difficulty encountered in changing patterns of thinking or
28 how cities think; "what local people know about the city, how they know and
29 experience the city, how they envision the city"(Muñoz-Erickson et al., 2017; 6),
30 is because knowledge arrangement is intertwined with the social organization of
31 cities so that transforming cities requires a simultaneous change of how knowledge
32 production is arranged and used in policy-making.

33 As knowledge co-production brings various types of expertise and multiple
34 institutions that differ in their organization, aims, and degrees of accountability,
35 the framework presents complexities of knowledge systems under three
36 categories; organizational, operational, and political, shown in Figure 7 The social,
37 institutional, and environmental complexity of cities contrasts with the simple
38 approaches that bind producers of knowledge and its users. However, institutional
39 structures capable of reasonably integrating institutional, ecological complexity
40 and city dynamics are more suited to developing practical sustainability strategies
41 and a long- term change.

42
43

1 **Figure 7.** *Layers of complexities in knowledge systems after Muñoz-Erickson et*
 2 *al. (2017)*

| Framework Concepts | Definition or Use in Knowledge Systems Analysis | Example |
|---------------------------|--|---|
| Organizational Complexity | When knowledge systems are in a complex decision-making landscape that involves a multiplicity of interacting actors and viewpoints, and complicated rules of procedure. Oftentimes knowledge and decision-making become tightly coupled to one another, such that integrating new knowledge into this form of closed system can be a very difficult undertaking. | Decisions involving ecosystem services typically involve trade-offs among ecosystem services and multiple stakeholders and organizations. Knowledge of the trade-offs among ecosystem services is often absent from or neglected within disconnected decision-making processes, leading to decisions that have unexpected or problematic outcomes. |
| Operational Complexity | Conditions under which highly dynamic social work is necessary to carry out the core functions of knowledge systems, involving diverse participants and organizations, and requiring careful coordination across the system's many organizational components. | The UN Framework Convention on Climate Change coordinates across multiple experts and organizations the various tasks of emissions inventories, including defining which emissions to count and allocate to responsible parties, the standardization of those methods, and the review processes by independent experts from other countries to ensure transparency. Boundary work and orchestration are also crucial functions to ensure legitimacy and credibility across multiple institutions and forms of expertise. |
| Political Complexity | Conditions of high interconnection between knowledge production and the exercise of political power, especially in the presence of conflicts within or between organizations. In the adversarial political context of the US, in particular, the connection of science and expert advice within many facets of decision-making in the US federal government is an illustration of the political complexity of knowledge systems. | The knowledge claims underpinning EPA regulatory decisions have been widely contested by both industry groups and environmental organizations, depending on which group perceived an interest in undermining EPA credibility on any given policy issue. Further layers of organizational complexity, e.g., the presence of the EPA Science Advisory Board, often exacerbate knowledge conflicts rather than mitigate them by presenting another opportunity for divergent views of the proper use of scientific evidence to arise and become subject to critical commentary by policy actors. |

3
 4
 5 Moreover, main principles or "design philosophies"; context and
 6 inclusiveness, adaptability and reflexivity, and knowledge–action network
 7 (Table.3; p.32), were stated some questions and strategies under each, to highlight
 8 considerations that ensure a successful design and implementation of knowledge
 9 co-production initiatives. However, there is a need for additional empirical
 10 research efforts to examine how these philosophies can help innovation in practice
 11 and assess the results in promoting sustainability and resilience in cities (Muñoz-
 12 Erickson et al., 2017).

13 Constructing institutional reflexivity is critical to avoid a lack of success in
 14 the future and build more adaptive knowledge systems. It is the idea that those
 15 who produce and use knowledge recognize and think about how to do it (Miller,
 16 C. and Muñoz-Erickson, 2010; Muñoz-Erickson et al., 2017) This includes
 17 allowing for a critical examination of all kinds of presumptions and practices that
 18 underlie the production and use of knowledge for sustainability (Hendriks and
 19 Grin, 2006; Muñoz-Erickson et al., 2017). However, the reflexive approach to
 20 improving the knowledge production process increases the "efficiency paradox" as
 21 it indicates a balance between openness and closure (Voss, 2006; Muñoz-Erickson
 22 et al., 2017; 12). Whereas closure is critical to productivity and acting, the timing
 23 can lead to a stalemate. Therefore, the timing and the structure of mechanisms are
 24 fundamental to achieving balance through an iterative process (Muñoz-Erickson et
 25 al., 2017).

26 In contrast to isolated networks-which are made up of homogeneous isolated
 27 units- network theory asserts that creativity and innovation are better provided by

1 different polycentric networks, where there is more possibility to reinforce existing
 2 capacities and connections where links are weak and to build up new ones where
 3 they are missing. Hence, efforts to create new knowledge systems must consider
 4 the characteristics that enhance central pluralism and expand opportunities for
 5 transformation (Grove et al., 2016; Muñoz-Erickson et al., 2017).

6 7 8 **Conclusion**

9
10 The article directly links artistic means of engagement as methods of
 11 activation with urban planning and sustainability. The need for a new approach
 12 towards global issues like climate change and lack of mutual understanding
 13 between various stakeholders of the city and authentic engagement are all
 14 introduced as part of the bigger need to realise change and social transformation
 15 on the ground. Also, this is linked to the need to move from passive spectatorship
 16 to immersion that provides more flexible, reflexive and catalyst methods of
 17 research, engagement and cities making. The main goal is that cities and
 18 processes that are set on track to be more sustainable but not guaranteed to be
 19 liveable will ultimately not be sustainable as those who experience it are human
 20 beings whose needs are more than just good function. Given its transformative
 21 focus, the study invites for ways in which innovative engaging two-way
 22 interactions could achieve more by moving from silo efforts to synergy (i.e. a
 23 combined effort produces more than separate efforts), as interactions are made
 24 more visible and shaped by combining the catalyst power of architecture and art
 25 with unique features and the capabilities of technology. The study suggested
 26 many ways of integrating place based and art based approaches to be done
 27 purposefully to ensure attachment and belonging as well as multi-influence
 28 spheres on a wide range of people as well as the city's life, resilience and image
 29 or atmosphere. Also, using a reflexive and reflective research approach is
 30 recommended as the paper advocates better alignment with human nature and
 31 stronger consideration of the social aspect to re-define the people in the city as a
 32 human, rather than mere users; and promote the integration of a rather needed
 33 scrutiny in upcoming governance models as they progress goals that require (and
 34 depends on) changing human behaviour and attitude.

35 36 37 **References**

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