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framing a research agenda
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A competence set for sustainable urban development: framing a research agenda

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ABSTRACT

The primary purpose of this paper is to call for more research on the competencies needed to promote sustainable urban development. Our premise is that sustainable urban development does not occur without transcending differing interests and identifying novel ways to collaborate across organisational and institutional boundaries. Relatedly, sustainable urban development calls for mobilisation and pooling of scattered assets. Therefore, sustainable urban development calls for enhanced competencies that significantly differ from the traditional capabilities valued in public administration. This premise leads us to determine what competencies are needed to support sustainable urban development and to ask how fragmented capabilities can be pooled to serve the common purpose. Sustainable urban development necessitates transformative system change, dependent on diverse stakeholders, relying on many actors’ knowledge and capabilities instead of a few selected actors’ expertise. To achieve a systemic perspective, we need to be able to group the capabilities and competencies; otherwise. We propose a conceptual framework drawing on insights from public administration, management studies, organisation studies, and the Intergovernmental Panel on Climate Change (IPCC) that might allow us to move from individual capabilities to shared competencies and collective learning processes, thus adding analytical leverage to our efforts to strengthen the competencies embedded in systems but held by individuals. For analytical purposes, we adopt the concept of the competence set. It is geared toward identifying how different capabilities of many actors could be integrated at a systemic level so that a set would serve both the entire urban system and the actors embedded in it.

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1. INTRODUCTION

The primary purpose of this paper is to call for more research on the competencies needed to promote and implement sustainable urban development (SUD).
Cities are not only centres of economic activity but also major sites in addressing the climate crisis, as they represent approximately 75% of global final energy use (Ranaldor et al., 2021). Consequently, making cities sustainable, inclusive, safe and resilient is one of the United Nations Sustainable Development Goals (Transforming Our World, 2015), and SUD is the guiding theme in the New Urban Agenda (Habitat III, 2017) and several policy documents published at the European scale (Territorial Agenda 2030, 2020). As cities are confronted with ecological, social and economic challenges (Millennium Ecosystem Assessment, 2005; OECD, 2010), the essential question is posed as follows: what competencies are needed to effect such a profound change that would allow cities to simultaneously meet ecological requirements and social and economic needs?

The difficulty in SUD is that social and environmental goals are often regarded as obstacles to economic development, and vice versa. SUD is difficult to achieve in practice because of a short-term perspective dominating politics and the many conflicts of interest. SUD is characterised by multi-actor and multi-value processes involving overlapping networks of public, private, community and academic actors, in which no organisation has a primacy in governance (Padt, 2007). Moreover, the vague nature of the SUD concept enables it to be understood and utilised in numerous ways and affects how SUD is understood and how actors perceive it. Thus, the practical and political implications of various interpretations attached to it in practice remain unknown (Griggs et al., 2017).

Consequently, in this short paper, we suggest that the urban and regional development community pay greater attention to what they need to learn to successfully meet the new demands, as the new challenges are not possible to be addressed with yesterday’s competencies. While we know that actors working for urban development have recognised their key positions in promoting SUD, why cities need to strive for it (Habitat III, 2017) and what action should be taken (Alvarez-Risco et al., 2020), we do not yet have in-depth knowledge of how all necessary measures could be carried out and which actor capabilities and competencies are required.

Our premise is that (a) SUD does not occur without transcending differing interests and identifying novel ways to collaborate across organisational and institutional boundaries. Relatedly, (b) SUD calls for mobilisation and pooling of scattered assets. Therefore, (c) SUD calls for enhanced competencies that significantly differ from the traditional capabilities valued in public administration (PA). This premise leads us to determine what competencies are needed to support SUD and to ask how fragmented capabilities can be pooled to serve the common purpose. In the following sections, we first define the concepts of capability and competence and finally argue for the need to pool competencies into competence sets. We follow Borrás et al. (2023) and believe that existing insights can be mobilised to understand the formation of capabilities and competencies for SUD at multiple levels – from the individual level to complex networks and systems (Capasso et al., 2019).

As the literature on capabilities in urban and regional development is scarce, not to mention SUD, we believe it is necessary to make use of the research work done in other disciplines. At the same time, regional development studies are uniquely placed to contribute to such debates, given previous work on such topics as spatial policies during crises (Martin et al., 2022), place leadership (Sotarauta & Beer, 2021), and the geography of sustainability transitions (Binz et al., 2020; Hansen & Coenen, 2015). We acknowledge that the many concepts around competency-related issues have been interchangeably applied. In this paper, we propose a conceptual framework drawing on insights from public administration, management studies, organisation studies and also the Intergovernmental Panel on Climate Change (IPCC) that might allow us to move from individual capabilities to shared competencies and collective learning processes, thus adding analytical leverage to our efforts to strengthen the competencies embedded in systems but held by individuals.
2. BASIC TENETS OF COMPETENCE THINKING

The concepts of capability and competence are often synonymously employed. However, for research purposes, we need to make an analytical distinction between capabilities, competencies and competence sets (Pralahad & Hamel, 1990; Teece et al., 1997). This line of thinking has mainly, but not only been applied in the business world. Those studies that have focused on capabilities in urban and regional development have mostly followed business scholars and applied their conceptualisations. For example, Best (1999) used Penrose’s (1965) theory, highlighting dynamics between capabilities and market opportunities. Also, Laasonen and Kolehmainen (2017) followed the resource-based view (Penrose, 1965; Wernerfelt, 1984) in their study on regional economic actors’ and networks’ capabilities (see also, for example, Laasonen, 2023; Lawson, 1999; Pihkala et al., 2007; Sotarauta, 2005). These studies show it would be possible to enhance SUD by systematically identifying the complementing capabilities and consciously constructing them. This task is challenging as capabilities must be pooled at a system level, at the intersection of multiple – often conflicting – intentions, interests and aims. A more nuanced conceptual framework may prove helpful when analysing capabilities in systems.

Javidan (1998, p. 62) used the concept of competence to refer to the combining and coordinating of capabilities, cutting across functions. Teece et al. (1997) defined capabilities as the firm’s ability to integrate, build and reconfigure internal and external skills and resources to address rapidly changing environments. Supporting SUD requires capabilities ranging from communication to marketing, from leading to regulation, from finances to technologies and so forth. We approach competencies as interlinked capabilities that are scattered throughout a network or a system but that may also be embedded mainly in a single organisation having a central position in a system (Sotarauta & Heinonen, 2016). In summary, in the context of SUD, competence is a nested concept that cuts across specific capabilities of several organisations. We assume collective competencies, drawing on individual actors’ specific capabilities, to determine the quality of sustainable development strategies and their implementation.

According to Pralahad and Hamel (1990), identifying and developing core competencies is an arena for coordinating and integrating dispersed functions and capabilities. The authors approach, accordingly, core competencies as collective learning. For Pralahad and Hamel (1990), core competencies comprise a collection of capabilities shared in a multi-industry and multi-site organisation. In the context of SUD, identifying and enhancing core competencies could be a way to close scattered actors’ capability gaps, facilitating the identification of various organisations’ roles in the system.

3. INDIVIDUAL LEVEL CAPABILITIES

According to Borrás et al. (2023), few studies address the competencies needed at the individual level for transitions towards sustainability, even if it is widely acknowledged that the needed competencies are rapidly changing. As competence is a nested concept in the SUD context that cuts across the capabilities of several organisations, we need to understand individual capabilities from a relational perspective, highlighting competencies as a nexus of internal and external assets, powers and capabilities. Consequently, we need to contrast the needed competencies regarding the traditional PA philosophy of government with the new public management (NPM) and new public governance (NPG). In PA, the responsibility of civil servants is to support the construction of rational policies and to ensure that they are properly implemented. Civil servants are supposed to make decisions by relying on their expertise in relevant fields. The long-held assumption is that the challenges civil servants have to overcome in policy development and implementation are mainly technical. Consequently, key capabilities include understanding
juridical procedures, having administrative skills, and foreseeing and avoiding future risks (Kruyen & Van Genugten, 2020).

The central idea of NPM is the implementation of management principles from the private sector in government; consequently, the capabilities required from civil servants are very different. However, briefly summarised, many of the needed capabilities are very similar to the capabilities required by private-sector employees. Capabilities that ensure that the public sector delivers ‘value for money’ are emphasised. These capabilities include good skills in preparing, signing and surveying contracts with private sector actors. Thus, having negotiating and controlling skills is very important in NPM. Additionally, being customer-oriented is essential as citizens are essentially considered customers who buy certain services (Kruyen & Van Genugten, 2020).

The issue then is how the complexities involved in SUD influence the needed capabilities. This issue is related to the increasing emphasis on ‘New Public Governance’ (Osborne, 2006), which relies more on interactive modes of governance than the more straightforward NPM. Consequently, it is crucial to determine what capabilities public sector employees need when the policy is aimed at stimulating transformative change through, by and with diverse groups of actors. Kattel and Mazzucato (2018) focus on the needed capabilities in the public sector to successfully develop mission-oriented innovation policies but remain at a generic level (all quotes on p. 797): ‘capabilities for leadership and engagement’ – ‘capabilities to encourage bottom-up engagement’ – ‘the ability to identify coherent policy mixes (instruments and funding) and capabilities for coordination’ – ‘experimentation capabilities’ – ‘evaluation capabilities’.

OECD (2017) and Nesta (2019) provided us with more specific and detailed conceptualisations of the needed capabilities. The former emphasises six skills: iteration, data literacy, user-centricity, curiosity, storytelling and insurgency. In particular, the latter very clearly illustrates changes in comparison to the needed capabilities from a traditional PA perspective, in which being disciplined and following the rules of bureaucracy are underlined. Nesta (2019) provided a toolkit that is explicitly developed to highlight the specific capabilities in the public sector that are needed to address wicked problems such as SUD. The toolkit makes a distinction between attitudes and skills. Attitudes are here understood as (p. 9) ‘settled ways of thinking or feeling about something’. Examples include being imaginative, outcomes-focused and courageous. In addition to attitudes, several specific capabilities are identified as important. These capabilities relate to three main areas: collaboration, leading change and accelerating change. Compared with OECD (2017), there is a considerable overlap: for example, storytelling, data literacy and curiosity are highlighted in both documents.

As an illustration of the changing needs in capabilities at the level of the specific positions related to SUD, we consider two different positions: the public procurement officer and cluster facilitator. A public procurement officer has traditionally worked to ensure low costs and set quality requirements for the procured goods and services. Traditionally, a mix of capabilities relating to traditional PA and NPM were needed: juridical knowledge, attention to detail, negotiation skills and commercial skills. However, with an emphasis on SUD, procurement practices undergo fundamental changes, requiring, for example, that procurement officers procure using functional requirements. Consequently, procurement officers must learn to translate long-term visions into specific procurement requirements and to communicate to a broader audience how procurement assists in addressing grand challenges (Edler & Georghiou, 2007; Edquist & Zabala-Inurriagagoitia, 2012).

A cluster facilitator, or a network manager, has traditionally worked to connect different actors to stimulate innovation. To successfully perform this task, one needs project management, facilitation and communication skills. However, with the transformation towards sustainability as the central goal, the objective is to facilitate specific types of innovations and to set or follow a particular direction for change for a cluster (Sjøtun & Njøs, 2019). This approach
requires system thinking capabilities to understand the localised consequences of the activities of the cluster. In addition, ‘selective facilitation skills’ are called for; i.e., the capability to understand and select the actors that need to be connected and supported to achieve a certain direction of change are valued (Grillitsch et al., 2019). Selective facilitation is crucial, as public actors are expected, on their part, to launch SUD-supporting processes and mobilise key stakeholders. Other actors are needed to contribute to the identification of the opportunities and to the finding a way to achieve them.

To make the individual capabilities serve SUD, we need to identify a way to study and develop them at a systemic level. Next, we discuss the concept of competence set as an approach to understanding how to pool individual capabilities and translate them into systemic competencies.

4. COMPETENCE SET TO SUPPORT SYSTEMS THINKING

Sustainable urban development is not only about boosting technological advancements. It necessitates transformative system change, dependent on diverse stakeholders (Coenen et al., 2015), relying on many actors’ knowledge and capabilities instead of a few selected actors’ expertise. To achieve a systemic perspective, we need to be able to group the capabilities and competencies; otherwise we would lose ourselves in detail. Therefore, for analytical purposes, we adopt the concept of the competence set. It is geared toward identifying how different capabilities of many actors could be integrated at a systemic level so that a set would serve both the entire urban system and the actors embedded in it (Sotarauta & Heinonen, 2016).

As Markard et al. (2012) pointed out, the literature on socio-technical transitions has provided us with a dynamic conceptual framework to explain and understand how systems change. Meadows defines a system as ‘an interconnected set of elements that is coherently organised in a way that achieves something’ (Meadows, 2008, p. 11). She posited elements, interconnections and a purpose as the three main constituents of a system. Drawing on their literature review on systems, Arnold and Wade (2015, p. 675) defined systems thinking as follows: ‘Systems thinking is a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviours, and devising modifications to them in order to produce desired effects. These skills work together as a system’. (Arnold & Wade, 2015, p. 675)

Renewing or transforming any system’s elements, interconnections or purpose is daunting, calling for well-established capabilities to think and understand systems and a variety of stakeholders. Representing a globally significant body that assesses the science related to climate change and translates scientific observations into policy, the United Nations’ Intergovernmental Panel on Climate Change (IPCC) provides a broad perspective on what is needed in policy and practice. Even though the IPCC has strongly emphasised the need for system-level changes, it has concluded that the capabilities (from individual to organisational to societal level) required to push for such a change are unclear due to a shortage of empirical evidence and successful practical examples (IPCC 2022a). The IPCC also acknowledged – with high confidence – that mitigation of climate change is place-specific, and therefore ‘the enabling conditions for shifting development pathways towards increased sustainability will therefore also differ, giving rise to different needs’ (IPCC 2022b, p. 43). In its reports, the IPCC mentions numerous capabilities, ranging from testing to asset mobilisation to expectations management. To understand the wide range of needed capabilities, drawing on an earlier extensive empirical study in Finland (Sotarauta et al., 2007) and our reasoning based on the conceptual analysis, we group capabilities into three main competence categories, which are substance, institutional and process competencies. (Figure 1)

In our framework, substance competencies include knowledge and expertise in specific technologies, services, industries, sciences, etc. Substance competencies involve an endless array of
‘know-why’ and ‘know-what’ related capabilities. ‘Know-why’ represents ‘an understanding of the principles underlying the construction of each component and interactions between them’ (Garud, 1997, p. 84). Thus, ‘know-why’ refers, for example, to obtaining appropriate technological solutions or incentive structures for SUD strategies and relates measures and tools. ‘Know-why’ also refers to the understanding and internalising of the requirements set by SUD-policies for practical work. More specifically, ‘know-why’ related capabilities may revolve around waste management, circular economy, digitalisation of services, green public procurement, etc. Basically, anything with a promise to reduce emissions or otherwise enhance SUD is included. Importantly, as Garud (1997) reminds us, knowing what to do, and why to do it, resides at the nexus of substance competencies.

**Institutional competencies** are a collection of capabilities to improve the playground and rules of the game for SUD (applying North, 1991), creating distinct and flexible frameworks for the substantial SUD work. Institutional competencies also include all the capabilities needed to improve regulative, normative and cultural-cognitive institutions in a specific SUD context (applying Scott, 2001). The foremost thing is to improve the institutional environment and arrangements to enhance human agency and to identify ways to align actors’ expertise and capabilities. For example, the public sector not only provides various actors with indirect and direct subsidies, but it also encourages the efficient mobilisation of private sector finances by creating a supportive institutional framework by correcting failures, removing barriers, providing information and sharing risk (IPCC, 2022b, p. 135). The IPCC (2022a; 2022b) also accentuates the importance of cities’ institutional capacity to develop, coordinate and integrate sectoral strategies within their jurisdictions, acknowledging the significant differences between cities globally. In an ideal world, the SUD development network forms a tightly knit entity where the fundamental issues of SUD are widely shared and internalised and different organisations recognise their role as part of the whole. Of course, the world is far from being ideal.

Moreover, as Mazutis and Abolina (2019) remind us, we should never overlook the complex act of implementing all the strategies and concrete ideas to support SUD. Therefore, we include not only technical tasks such as ensuring that a system or a network is aligned with policies and formal alliances but also tasks such as securing funding and lobbying the government into the broad category of institutional competencies (Mazutis & Abolina, 2019). Moreover, all the new strategies and ideas need to be institutionalised, requiring well-established and shared institutional and process competencies. In summary, institutional competencies are needed to improve institutions, efficiently act on them and institutionalise innovations and new practices.

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**Figure 1.** The competence set model in a nutshell.
Process competencies refer to the capabilities for leading and managing interactive processes, creating conditions for commitment, and seeking future possibilities, but also to personal, energising charisma. ‘Know-whom’ and ‘know-how’ capabilities are typical building blocks for integrated process competencies (Defilippi & Arthur, 1994; Garud, 1997). ‘Know-how’ related capabilities enable one to understand and guide complex SUD-related networks – how to get new ideas through planning and decision-making processes, how to persuade different actors to collaborate, how to prevent conflicts and identify common interests among the goals of other actors, etc. (Hinchliffe, 2002; Lundvall & Johnson, 1994). ‘Know-whom’ capabilities are social capital skills – who are the key individuals, how do they think, what do they support and/or oppose, what are their goals, etc.

The IPCC (2022b) showed how institutional competencies are dependent on well-developed process competencies. According to the IPCC, clear climate policy signals support mobilising private funding and guides investment decisions. If governments and the international community were capable at credibly signalling about the investments opportunities and their future prospects, it would reduce uncertainty for financial decision-makers and thus mitigate anticipated risk. We see process competencies supporting what the IPCC is after, and what it deemed as missing in many cities (IPCC, 2022a, 2022b). Process competencies include the capability to involve people and empower them to act as a network; the capability to make people work to reach joint and separate goals and renew them in an ongoing process, the capability to promote interactive processes serving as an intermediary in interaction between actors and steering activities towards seeking goals and enabling co-operation, and the capability to connect various actors to the knowledge pool from their own starting points (Sotarauta, 2005). These competencies also includes social capabilities referring to producing shared and often tacit knowledge potentially leading to the social integration of actors, reaching far beyond the integrative force of institutions. Absorbing new knowledge, people and money into SUD work is essential. Therefore, interpretive capabilities surface, i.e., capabilities to value, assimilate and apply new knowledge and to transfer visions and strategies into action are crucial in managing processes.

We should never take for granted that all the actors needed to work for SUD are keen on contributing to or participating in collective efforts. Thus, motivational capabilities belong to process competencies and need to be included in the competence set. One needs to understand many ‘silent messages’ or various actors conveying the compatibility or incompatibility of beliefs, values and identities. Thus, process competencies also need non-technical know-why capabilities. Here, process competencies also deal with ‘existential’ issues – why do we do all this, what are we aiming for, why do we implement these strategies, what is the nature and identity of different agents contributing to or opposing SUD strategies, etc. These capabilities are crucial, as the future only exists in the present as some form of anticipation (Miller, 2018). Therefore, to make sense of the many overlapping development trajectories, we should not only believe in a predetermined future and work for the desirable vision but also work tirelessly to assess the continuously evolving SUD-paths. Such capabilities that assist us in identifying conflicting views about the future and the actor groups behind them are needed, which may be crucial in mitigating conflicts and working towards collective action. Capabilities to identify individual and conflicting visions and to detect and create common dominators – to search for the ‘third way’ – may be a prerequisite for collective action.

5. CONCLUSIONS

In this article, we underline the importance of systematically pooling scattered capabilities into competence sets. We propose a tentative and still-porous conceptual framework to explore the existing competence sets, especially gaps in them, thus supporting a more integrated SUD work.
Overall, it is easy to conclude that without sufficient substantive expertise in sciences and engineering (know-why), we will never succeed in the green transformation. We also need specialised actors to lead and manage SUD processes, knowing how to work on a system and change it step by step.

In an ideal world, actors could compensate for each other’s competence deficiencies with smooth collaboration. However, as the world is not perfect, there is a need to boost core competencies (learning processes) to integrate different capabilities into competence sets. Enhancing processual and institutional competencies may be crucial, as the NPG call for actors to produce results in an ever more complex environment and, consequently, the mismatch between the grand ambitions guiding SUD and the knowledge of delivering change is not diminishing. Therefore, it is essential to acknowledge that various actors may value needed competencies differently, causing difficulties and hindering SUD efforts.

SUD is governed across networks of public, private, community and academic actors, necessitating consideration of the variation or lack of it in the competencies needed among various cities. However, studies that systematically connect competence thinking to SUD are rare. We suggest that the competence set approach may prove promising in terms of sustainable transitions and as a tool for city leadership. In addition to a general need for more attention to urban competence sets and individual capabilities in the core of them, we propose three specific research topics. First, as indicated above, the needed competencies vary according to the functions and roles of the public, private and higher education sector actors. To date, we have insufficient knowledge about this variation. Second, we need to understand better competence requirements across different types of organisations and their roles in the system (Sotarauta et al., 2021). Third, while individual capabilities can be considered the micro-foundations for core competencies and competence sets at higher levels of aggregation, we have minimal knowledge about the occurrence of the aggregation. Places characterised by similarities in individual capabilities may substantially vary in competence sets, highlighting the importance of understanding differences in aggregation processes.

We still lack sufficient knowledge about how the aggregation of individual capabilities contributes to SUD across cities. Perhaps, the concept of the competence set has been the missing link.

**DATA AVAILABILITY STATEMENT**

As the paper is conceptual, we do not have data to share.

**DISCLOSURE STATEMENT**

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**NOTE**

For each of these six skills, there is a description of associated practices and a distinction between the different levels of needs, ranging from what a basic user would have to know to the requirements of a regular practitioner.
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