KNOW

Knowledge in Action
for Urban Equality

Knowledge co-production for urban equality

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Cover

Kente cloth

'*Kente*' cloth is a silk or cotton handmade fabric popular among the Akan of Ghana, but worn by almost every other ethnic group in the country. The Akan word 'kente' loosely translates to 'basket', representative of the intricate process of interweaving individual colourful threads and collated strips to create beautifully patterned broadcloth.

The notion and methodological approach of co-production evokes an element of collectiveness; an interwoven e ort through partnerships of equivalence and recognition of the unique contribution of each individual actor in such an endeavour.

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Abstract

This working paper serves as the basis for a critical examination of the notion of knowledge co-production. First, the paper examines how the idea of knowledge co-production has emerged in relation to the parallel but distinct concept of service co-production and the participatory development planning tradition. Second, the paper examines the variety of processes of knowledge co-production that may take place in the context of academic research.

In doing so, the working paper highlights the centrality of knowledge co-production in the KNOW project's research strategy, with a focus on actionable knowledge that may support transformative trajectories towards urban equality. Such an approach is based on the view that knowledge production underpins the process, ethics, and outcomes of any urban development intervention.

Looking at well-documented examples of knowledge co-production in research for urban equality, the review examines how knowledge co-production is delivered in practice. The focus on how knowledge co-production is used in action research also helps to identify some limitations and key challenges, and existing mechanisms to overcome them. The working paper ends with a proposal for a research agenda on knowledge co-production in the context of the KNOW project.

Key words:

Knowledge, urban equality, co-production, planning

Introduction

"Knowledge is socially constructed, and it is therefore 'situated' and affected by the social position of the producer of everyday life, challenges the dominant viewpoint, and provides 'partial visions' which are subjective, embodied and diverse" (Böhm *et al*, 2017: 230).

The notion of knowledge co-production underpins the project *Knowledge in Action for Urban Equality* (KNOW). This notion refers to a collective process of creation. Initially developed with reference to service provision, co-production came to the fore as a response to the failures of top-down and centralised approaches to service delivery (Percy, 1984; Warren, Rosentraub *et al.*, 1984; Weschler & Mushkatel, 1987; Ostrom, 1996). By recognising the difficulty of delivering equitable and sustainable service provision without the active participation of service beneficiaries, co-production was defined as a process through which inputs from individuals who are not "in the same organization are transformed into goods and services" (Ostrom, 1996: 1073). In this light, co-production of urban services has progressively been interpreted as a push for increased citizen participation in the design and implementation processes of service delivery, based on an appreciation of citizens' views, knowledges and experiences; the result is an example of the actionable nature of co-produced knowledge or what we term, 'knowledge in action'.

Today, co-production is used in a variety of contexts beyond the co-production of services, and relates to institutional co-production and co-production of knowledge (Galouszka, 2018). In the context of policy-making, governance, and research, it is an increasingly popular term[1] often discussed as a form of engagement between different stakeholders in policy and planning as well as a distinct approach to knowledge-building in research (Moser, 2016). As a methodological approach, it fits well within international development, humanitarian, and resilience-building research and other processes, where the multi-partner nature of such research ensures that there is a multiplicity of perspectives that can be drawn upon (Collodi *et al.*, 2017). It offers a response to critiques of the process and content of research by meaningfully including communities and other stakeholders in design and delivery. Consequently, co-produced research is seen as a means to address the 'relevance gap' and increase research impact, particularly with regard to the policy reforms and actions necessary to address common issues (Durose *et al.*, 2012). In other words, co-production is regarded as having the potential to enhance the effectiveness of research by tying it to community preferences and needs; enabling communities to contribute to improved outcomes and achievable solutions (Ostrom, 1996; Galuszka, 2018). This is particularly relevant in the global South where co-production may become one means of overcoming institutional bureaucracies and regulatory norms that are exclusionary and otherwise counterproductive for the welfare of the urban poor or informal settlements (Galuszka, 2018). The relevance of co-produced research in service delivery has the potential to bring about some innovation or improvements through projects where formal channels of engagement do not exist or are not satisfactory (Watson, 2014). It is also an important way of spurring community engagement in urban development-related policies that are barely or only marginally implemented.

In this review, we focus on knowledge co-production, and more specifically on actionable knowledge that may support transformative trajectories towards urban equality. This is based on the notion that knowledge production underpins the process, ethics, and outcomes of any urban development intervention. The paper is structured in four parts. First, it addresses the question: what is co-production of 'knowledge in action'? In this section we draw on different perspectives on the creation of knowledge that can support the development and implementation of progressive policies and planning, and outline some key distinguishing features. Second, we address why knowledge co-production, in this regard, is important for achieving urban equality. Specifically, we refer to the kinds of knowledge and knowledge production processes associated with the normative objective of urban equality, along with the issue of 'whose knowledge counts' in the production of science and expertise. Third, we discuss how knowledge co-production operates in practice. We explore different cases where the approach of knowledge co-production has been used, highlight challenges involved in the process of co-producing knowledge and focus on some of the mechanisms deployed to overcome them. Fourth, the conclusion outlines a research agenda on knowledge co-production and explores what it means in the context of KNOW and as a point of departure for urban equality research. Specifically, we interrogate the situated conditions under which knowledge co-production can lead to pathways to urban equality.

Underlying this reflection is a critical appreciation that knowledge co-production may not necessarily deliver on urban equality ambitions nor, indeed, represent the sole means of addressing urban inequality. Antonacopoulou (2009) highlights the need for researchers to continuously reflect on, and query, the 'actionable' nature of knowledge that is co-produced, bearing in mind and capturing the distinct processes of knowledge co-production and the facilitation of knowledge integration, or as we term it, 'knowledge in action'. This goes beyond the conceptualisation of the former as a precondition to, or coming before, the latter in a linear causal chain. Instead, what is required is an "understanding of the complex interrelationship between knowing what (cognitive/theoretical knowledge), knowing how (skills/technical knowledge), knowing to what end (moral choices) and doing (action/practice)" (Davoudi, 2015: 318).

Consequently, our task in the KNOW project is to understand how, and under what conditions, knowledge co-production

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1   Notable mentions of large research consortia applying co-production as a key methodological process include: "Building Resilience and Adaptation to Climate Extremes and Disasters" (BRACED); "Mistra Urban Futures"; "Weather and Climate Information Services for Africa" (WISER); "Towards Forecast-based Preparedness Action: Probabilistic forecast information for defensible preparedness decision-making and action" (ForPAC); "Why we disagree about resilience" (WhyDAR); "Adaptive Social Protection - Information for Enhanced REsilience" (ASPIRE); "Urban Africa Risk Knowledge" (Urban ARK); "Future Resilience for African Cities and Lands" (FRACTAL); "Moving with Risk"; and "African Monsoon Multidisciplinary Analysis 2050" (AMMA 2050).

might entrench or redirect trajectories towards urban equality. To paraphrase Freire (2000), we need to find what kinds of 'pedagogies of the oppressed' can change the city. We therefore situate the KNOW project in the context of recent key knowledge co-production endeavours to both highlight its specificities and reflect on key underpinning principles, which bring together the variety of knowledge co-production practices uncovered (and experimented with) in the context of KNOW. It is also acknowledged that the specific city and community contexts provide a critical precondition for knowledge co-production and its uptake or action to address local issues.

What is knowledge co-production?

The KNOW project's research strategy is based on the notion of co-production of 'knowledge in action', which is seen as essential for supporting the development and implementation of progressive policies and planning. In turn, such an approach rests on a number of key assumptions. These relate to the role of knowledge in the context of planning and interventions in the urban realm. Co-production also rests on an epistemology of knowledge that challenges unitary visions and instead embraces knowledge production borne of the confrontation and juxtaposition of multiple ways of living, working, and seeing the city. In the following section, we explore why the normative focus of the KNOW project – supporting/entrenching pathways towards urban equality – makes such an approach to knowledge production all the more salient. As Rydin has argued:

> "Knowledge differs from information and data in that the specification of a causal relationship is central to knowledge. This is why knowledge is of such central relevance to planning" (Rydin, 2007: 53).

The action-orientation of the KNOW project means that the research will question the role of knowledge – therefore of causality – in decision-making related to planning or interventions in urban space, hence, spatial knowledge which has to do with the social production of space. It will also examine the role of knowledge in understanding the opportunities and challenges facing purposeful interventions.

In this context, there has been a growing recognition of the limitations of some of the epistemologies that underpin causality in decision-making generally, and interventions in urban space more specifically. Knowledge is not the preserve of scientists and experts; the production of knowledge is, in itself, a social activity in which multiple actors – whether they are scientists or not – can be deemed to hold relevant knowledge to address and characterise sustainable development challenges. Co-production is therefore seen as one pathway to develop spaces for learning and cross-institutional reflection between academia and policy, in the spirit of more sustainable urban transformations (Perry & Atherton, 2017). Studies in environmental justice and development planning have demonstrated the numerous ways in which all kinds of social groups are involved in the systematic

collection of data and synthesis in knowledge-making narratives (Irwin, 1995). This process can lead to the legitimisation of some forms of knowledge over others, as well as the potential for communities and citizens to prioritise some problems over others (Capek, 1993). Moreover, engaging with multiple forms of knowledge may determine the legitimacy of an intervention in a particular context, because citizens use their own contextual knowledge or lived experiences (Fenge et al., 2011) to assess the credibility of experts' claims (Yearley, 2005). Knowledge production is contextually contingent and interest-driven, both within science and within broader societal sectors (Gieryn, 1999).

These reflections reveal a long-standing concern with the uncritical inclusion of science and expertise in decision-making and urban action. According to Fischer (2000), technocratic approaches to decision-making grounded in the ideal of an absolute, objective form of knowledge, are deeply undemocratic. Sheila Jasanoff (1987) has long worked to think through the relationship between science and policy, and how the distinction between what is pure knowledge and what is action is itself politically charged. On these foundations, she developed a theory of knowledge co-production. Jasanoff's work resonates with on-going debates within sustainability science and sustainable development that focus on the development of 'socially robust knowledge', which incorporates a wide variety of perspectives, especially those which are considered contextual or 'lay' (Nowotny et al., 2001; Bretzer, 2016). In this context, Jasanoff (2004) claims that there is a need for a radical change in the governance cultures that does not stop at increasing participation, but rather, involves citizens directly in the production of science and expertise (Jasanoff, 2003). In this way, knowledge co-production directly challenges the social order because it fundamentally questions how we make decisions. Her approach calls us to focus on four points:

• framing (what is the purpose?);
• vulnerability (who will be hurt?);
• distribution (who benefits?); and
• learning (what do we need to know and how can we find out about it?) (Jasanoff, 2003).

These ideas have long influenced planning theory and dovetail with other critical strands in planning that question the knowledge-base of planning and, in turn, planning's claims as an activity 'in the public interest'. Marxist, post-modern, and post-colonial critiques have played different roles in unveiling power dynamics at the heart of planning as well as the oppression of various forms of knowledge. In turn, these critiques highlight the importance of recognising and voicing the knowledge and experiential practices of cities' varied publics as a necessary condition for more equitable and socially just decision-making and planning. Following the rise of a collaborative planning, the field is currently being framed as "an embedded political practice of collective management of complexity and uncertainty under multi-actor, multi-temporality, multi-scales, and multi-disciplinary approaches" (Ortiz, 2018: 1). This understanding of planning moves towards emancipatory forms of policy-making in as much as it recognises that urban governance operates at

different scales through an ecosystem of formal and informal institutions where the state, civil society, and private sector actors negotiate regulatory frameworks and practices to influence urban equity. Thus, knowledge co-production is pivotal as a process that creates "opportunities for new ways of thinking, relating and acting together" (Bretzer, 2016: 38).

However, alternative and less favourable views of co-production in action bring attention to the narrow instrumentalisation of research and the effects of a creeping 'impact agenda' in the social sciences that seeks to regulate, manage, control, and direct science in a new form of 'knowledge politics' (Stehr, 1992). The criticism that policy-makers seek evidence to support policies, rather than designing policies around evidence (Sharman & Holmes, 2010), raises the spectre that closer co-operation with academics replicates a delivery mode of consultancy in which critique evaporates (Perry & Atherton, 2017).

Why knowledge co-production matters for achieving urban equality

The normative goal of the KNOW project – advancing urban equality – puts a particular onus on the co-production of knowledge in action for a number of reasons. For a start, urban equality is a relational phenomenon; advancing equality depends therefore on understanding situations in which multiple points of view exist. Equally, urban equality cannot be understood through a one-size-fits-all lens. Instead, a contextual analysis is called for; attentive to local/national/global dynamics as they interact in place. In turn, planning for action in the context of current, complex environments requires multiple voices and entry points. It is precisely the particularly 'wicked' nature of the problem – urban equality – that demands an emphasis on recognising the lived experience and knowledges of a variety of actors, especially those that are often unheard, as key to uncovering structural obstacles to urban equality. This is because trajectories of transformation towards urban equality require addressing deep entrenched structural issues, often invisible from 'traditional' planning rationalities and processes. We acknowledge that this unequal reality may lead some to favour alternative modes of change (e.g. more agonistic or more combative). However, co-production offers an approach to shifting asymmetries of power through collaborative processes. This does not suggest or underestimate the complexities associated with coordination of processes and actors necessary for meaningful co-engagement.

Advancing equality depends on understanding situations in which multiple points of view exist. For an intervention to work towards urban equality it requires a terms of reference to manage the expectations of actors with these different perspectives However, the central aspect of any intervention in the context of uncertainty will require knowledge management procedures both in terms of stating the multiple understandings of the challenges at play (multiple knowledges) and to establish the relationship of those understandings with plans for action and

future visions (Castán Broto, 2009). Determining who holds a particular kind of legitimate knowledge – who is an expert? – is a central question shaping environmental justice debates (Castán Broto, 2013; Caprotti *et al.*, 2017), as well as varied participatory approaches to planning (Gaventa *et al.*, 2006; Rydin, 2007).

The KNOW project frames urban equality as a normative goal that encompasses achieving an equitable distribution of material resources, the reciprocal recognition of social identities, and parity in political participation. In order to have impact in each of these intertwined spheres, wide sets of knowledge need to be co-produced and critically reflected upon amongst project partners. First, in order to support the shift in the material distribution of resources and services, there is a need to reveal the particular institutional, legal, and financial frameworks and practices that shape the current regimes of rights and responsibilities between the state and civil society in specific places. In the same vein, the spatialities of injustice are inscribed in the urban form as well as the geographies of spatial quality, access, connectivity, and use of collective facilities and services; these too need fore-fronting and, at times, revealing. Second, to bring about reciprocal recognition, an intersectional approach to justice needs to inquire how the urban experience is deeply influenced by existing gender property regimes and power constellations marked by ethnicity, age, and sexual orientation, which also play out through intersecting mechanisms of discrimination. Moreover, it requires multiple participants to address how social identities relate to urban opportunities and how, in turn, the urban fabric reflects the values, aspirations, memories, and spatial imaginaries of different urban identities in cities. Third, to advance parity in political participation, it is necessary to work beyond party politics and delve into the arenas where active citizen engagement occurs, including state-sanctioned and citizen-led spaces; to stir social mobilisation and influence decision-making scenarios.

The complexity, the myriad responsible stakeholders, and the long-term scope of addressing urban equality require an approach to research for action that emphasises actors' co-responsibility for bringing about sustainable urban futures. Therefore, an integral part of building pathways to urban equality relies on recognising the plurality of knowledges that shape cities as well as their links to the diverse power systems embedded in the trajectories of urban settings. The role of knowledge is crucial to uncover silent voices with relevant understanding about structural factors that hinder urban equality. Moreover, it is critical to think collectively how to unlock the potential of existing practices that challenge existing conditions and seem to make a difference in moving towards urban equality. That is why the co-production of knowledge is a central approach to tackle socially and politically relevant research in each of the localities where the project operates.

The nature of the KNOW project – an international, multi-partner, and multi-site research project – implies catering both for the particularities of the cities involved and their inter-connections across regions. At the core of framing knowledge

co-production for KNOW is a collective discussion about what needs to be known and whose knowledge counts to advance collective action aimed at addressing the roots of inequality, as well as seizing opportunities to advance pathways to achieve urban equality. In this context, we aim to overcome a "rationalist conception of knowledge as objective, universal and instrumental" (McFarlane, 2006: 288) and instead conceive "knowledge and learning as partial, social, produced through practices, and both spatially and materially relational" (McFarlane, 2006: 289). This conception of knowledge and learning suits the intention to delve into the ways in which equitable urban development can be realised. In the same line, this conception resonates with the idea that city-dwellers need to be seen as creators of epistemologies with different ways of knowing and holders of valid knowledge (Escobar, 2018) to influence decision-making for urban transformations.

How knowledge co-production operates in practice

This section attempts to discuss key features or principles that allow for the knowledge that emerges from such partnerships to be duly termed as 'co-produced'. It reflects on the application of co-production inside and outside of academic research projects and their implications for the KNOW project. Recent academic projects that have adopted co-production as a central process to knowledge production are referred to. These are the DFID funded, "Building Resilience and Adaptation to Climate Extremes and Disasters" (BRACED) project and the "Mistra Urban Futures Project". Both involve multi-country, multi-disciplinary, and multi-partner research consortia across the global North and South; engaging with the themes of climate change resilience and a drive to create just cities. The dynamics of large research consortia delivering time-bound, co-produced research that draws on the participation of mainly community, civil society, and academic partners brings up valuable lessons on the nature and practice of co-production, which are operationally instructive for KNOW.

Case study: The Mistra Urban Futures project

Co-production processes have contributed to sustainable change in addressing local challenges (Mistra Urban Futures, 2016). They are understood to underscore long-term, community-based campaigns and struggles where partnerships of residents are important for advancing these campaigns. It includes training in how to talk to, and engage with, experts, how to understand the expert's research findings, and in some cases, how the community can derive its own calculations. But the function of experts is only to facilitate. Such participatory consultation serves both to broaden citizens' access to the information produced by scientists and to systematise their own 'local knowledge' (Fischer, 2000).

Knowledge co-production processes have an inherent potential for capacity-building. However, it is important to ensure that this is not a top-down exercise but an equitable, horizontal sharing of skills and expertise that inherently supports the 'receiver' to question and refine the capacities offered in-line with her/his own needs (Collodi et al., 2017). Mistra Urban Futures (2016) recognises the potential value of capacity-building, especially in sustainability research. They expressly incorporate it into their definition of knowledge co-production, which refers to collaborative processes where different actors and interest groups come together with researchers to share and create knowledge that can be used to address the sustainability challenges faced today, and increase the research capacity to contribute to societal problem-solving in the future (Mistra Urban Futures, 2016).

Mistra Urban Futures (2016) describe their approach to co-production as a process of relationship-building with particular reference to their work in Manchester, UK. This is expressed as an 'art form' that represents the highest manifestation of mature relationships between researchers and practitioners. In other words, the focus on relationships allows co-production to transcend limited project time-boundaries and sets the tone for further, future collaborative work after a project has been completed.

Mistra Urban Futures have demonstrated the potential of co-production to contribute to 'knowledge in action' in their target cities, by driving changes in local political and administrative agendas, policies, and budget allocations, including stronger intra- and inter-agency knowledge, and more in-depth connections and relationships within and between different organisations (Mistra Urban Futures, 2016). However, Mistra Urban Futures has encountered a challenge often embedded in co-production processes: it is hard to distinguish whether such impacts result directly from co-production efforts or from more general trends within a deliberative society. Tracking the impact of knowledge co-production is a challenge in a society that seeks to systematise our understanding of how to intervene in shaping urban futures. The issue of how to capture the diverse impacts and outcomes that can be credited to the Mistra Centre, while delivering excellent research outputs, is a challenge that the KNOW project is also encountering.

Case study: The BRACED project

Drawing on the experience of the recently concluded, "Building Resilience and Adaptation to Climate Extremes and Disasters" (BRACED) project, it is important to emphasise that all partners share responsibilities for learning. While one organisation may take the lead in enabling learning, this is a communal activity with each partner needing to have a clear understanding of its role, responsibilities and expectations. Co-production requires each organisation to develop its capacities for collaborative learning across sectors and levels of decision-making (Visman et al., 2016; Collodi et al., 2017). Within the collaborative project, BRACED, partner organisations appointed 'learning leads' to take up responsibility for championing learning within their own organisation and more widely. This may be instructive for

the KNOW project working across multiple cities and regions. Learning should be recognised as an inherent part of every stage of the project from design and implementation to review. The openness and willingness to learn collectively seems to be an intrinsic characteristic of co-production efforts.

Collodi *et al* (2017) move a step further by proposing the development and use of a project-specific 'learning framework' to guide the consortium process and serve as a tool to facilitate co-production. The learning framework includes a series of principles to underpin collaborative learning, which are reviewed and agreed by the consortium. These include partners taking ownership and responsibility for supporting learning within the consortium and sharing emerging project learning within their own organisation, and partners committing to openly share good practice as well as failures and challenges. Partners recognised the benefits of investing time and resources in developing frameworks for learning which moved beyond contractual and formal relations to support informal relations, particularly between partners with limited experience of collaboration and where activities require engagement across sectors, disciplines, and countries (Visman *et al.*, 2016). However, the downside is that such co-production efforts rely on unpaid and voluntary work which is often unaccounted for. This is yet another important step to acknowledge in the co-production process that would be worth documenting within the KNOW project as it could explore learning frameworks and learning champions.

Furthermore, Jones *et al* (2016) affirm the importance of learning for the co-production of knowledge by identifying the process of learning as distinct from the co-production process itself, highlighting its occurrence as a deliberate step. In other words,

knowledge co-production goes beyond the mere collaborative effort between different knowledge sources that have the potential to generate new knowledge, to include the deliberate, iterative process of recognising and promoting collective understanding and openness in engagement. The authors describe the learning process in knowledge co-production as consisting of the following elements:

- identification of places for ongoing learning and review, within and between partners and external stakeholders;
- sharing of responsibilities and building of capacities for collaborative learning, rather than relying on an intermediary organisation;
- ensuring learning activities that are relevant to all partners, as operational partners prefer practical approaches to learning with demonstrable benefits for at-risk groups.

In the case of BRACED, the academic partners played a critical role in facilitating learning within the consortium and for the consortium. This entailed developing close relationships with the other partners to understand working practices and the scope, constraints, and challenges that could be envisaged in the project. *Figure 1*, below, clarifies the roles of the academic partner, Kings College London (KCL), and the other partners within the consortia for knowledge co-production, for which there was a dedicated Knowledge Manager steering the exchange and learning.

The co-production of knowledge also poses its own challenges. It requires role clarity, attention to power imbalances, difficult discussions about research rigour versus research relevance, and constant monitoring (Holmes, 2017). Unattended, these challenges can lead to (and/or be accentuated by) boundaries
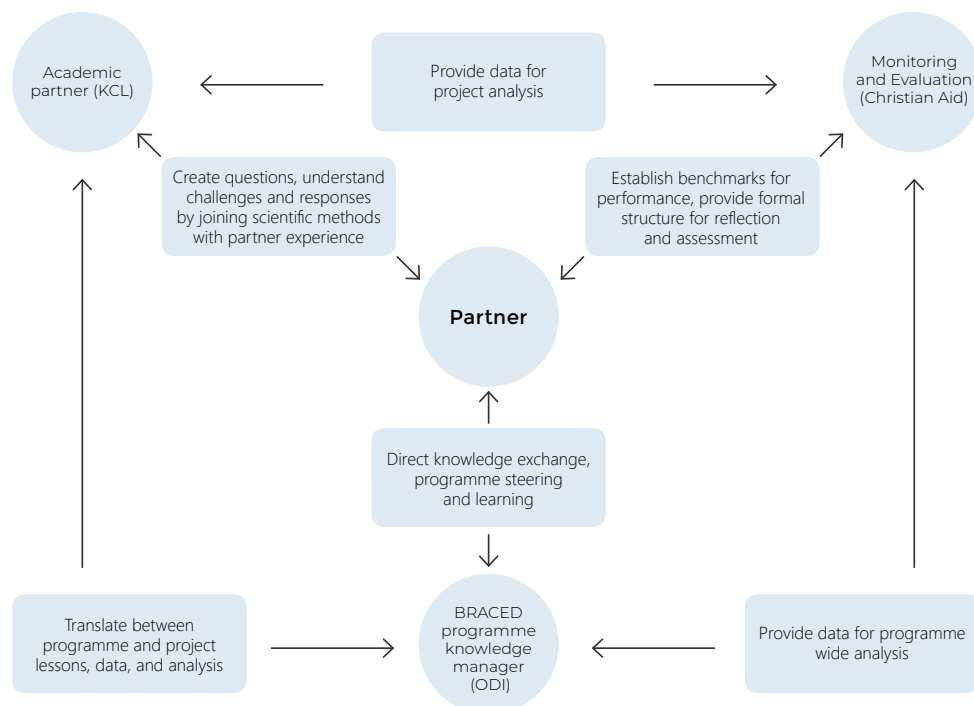

Figure 1 Roles and relationships for learning in the BRACED project (reproduced from Visman et al., 2016: 4).

that are inherent to multi-partner collaboration. However, working collaboratively in learning processes requires skills and mechanisms that can overcome boundaries (Pohl *et al.*, 2010). These boundaries can be organisational; separating organisations according to expertise and project goals and discouraging the sharing of knowledge. They can also be inter-personal, resulting, for example, from established hierarchies and competition that can hinder collaboration and sharing of knowledge. For co-production to succeed, everyone needs to get something out of it. Partners involved in co-production need to recognise their differing incentives for engaging in collaboration and jointly negotiate a plan that addresses their respective impact requirements (Visman *et al.*, 2018). Additionally, co-production across, academic and non-academic partners requires a lot of time, negotiation, and patience from both sides to develop a research methodology that meets academic rigour yet ensures that the data collection process is feasible and practical (Durose *et al.*, 2012; Collodi *et al.*, 2017)

Another challenge is to ensure that the learning processes in knowledge co-production are complete. In this light, Durose *et al.* (2012) argue that despite best efforts, the timescales, pressures, politics, and priorities of researchers may not always be shared with communities, or other non-academic partners, who may be content to allow researchers to get on with 'their' job. The

need for unaccounted, voluntary work and trust requires a level of commitment that simply cannot always be achieved. How can co-production programmes support a stronger engagement which focuses on the development of that commitment? Co-production practitioners have long spoken about longer-term projects, processes of engagement that focus attention on local priorities, and a careful planning of co-production activities to match the rhythms of community life. Nevertheless, none of these measures – in the rare occasions when they can be achieved – have demonstrated that co-production is a smooth process. Rather than seeking to deliver a completely perfect governance process, co-production practitioners need to be sensitive to the implementation of co-production processes as incomplete and imperfect; where being under permanent revision is as important as achieving collective results.

Learning in knowledge co-production is not only through the creation of new ideas or knowledge relevant to the project aims *per se*, but also includes learning and shifts in culture, values, methods of respect, and appreciation, and valuing each partners engagement (Visman *et al.*, 2018). These examples illustrate one of the most important challenges of co-production: bringing together not only diverse individuals, but the institutional and cultural practices they bring along with them; the different mind-sets about how things should be understood and done;

Principles to apply during the development and initiation of a project:

- Partners jointly identify an issue where they can productively work together to address a concern prioritised by the people whom an initiative seeks to support;
- All partners factor in sufficient time and resources to support the required steps in the process of co-production, including building common ground to understand each other's ways of working;
- While expecting and accepting differences and tensions, partners reach a shared vision and common purpose;
- The respective knowledge of each partner are explicitly recognised as vital to enable effective resilience-building;
- Partners jointly agree the principles and ways of working that will underpin their collaboration, ensuring that co-production roles and responsibilities are clearly mapped out, communicated, resourced and integrated across the project process and that the people whom an initiative seeks to support wherever feasible.

Principles to apply throughout a project:

- Socially-relevant research outputs are continuously produced;
- Access to project knowledge is open;
- Research is undertaken in a currently-relevant, locally validated and accountable way;
- Researchers appropriately communicate the levels of certainty and confidence of the risk information they provide;

- Research approaches recognise different learning styles, different ways of spaces for interacting with the social and physical environment (such as cognitive, emotional and spiritual factors) different entry points and pathways for informing and influencing decision makers;
- There is continual impact assessment at all decision-making levels and within both policy and scientific arena;
- Opportunities are afforded for continuous formal and informal review and learning;
- Partners commit to act on emerging learning, seek address for emerging, and unaddressed issues of concern, revise plans and approaches and to end, document and share learning about co-production initiatives that are not proving effective;
- The project retains sufficient flexibility to address emerging concerns, brining in additional expertise, employing new approaches and commissioning additional research, where required.

Towards the end of a project:

- Partners identify, document and share learning about those processes, approaches and ways of working that support effective co-production processes to continue in the longer-term;
- Project learning informs ongoing and future research, development and resilience-building priorities;
- Project learning feeds into wider strategic conversations.

Figure 2 Underpinning principles and ways of working that enable co-production (reproduced from Visman et al, 2018: 2).

as well as professional and political mandates, and ways of communicating (Mistra Urban Futures, 2016).

The BRACED project proposed three phases of the principles that in hindsight underpin the co-production of knowledge in an academic project. These include: principles that apply during the development and initialisation of the project; principles that apply throughout the project; and principles that apply towards the end of the project (Visman *et al.*, 2018). The principles tabled in each phase, including those discussed previously, are neither exhaustive nor prescriptive. However, these principles establish a point of departure to reflect on the challenges of co-production within the KNOW project. The principles underpinning the process of knowledge co-production during the stated phases of an academic project are summarised in *Figure 2 (previous)*.

Table 1, below, offers a comparative overview of KNOW and the two co-production programmes discussed above, Mistra and

Co-production comparison	BRACED	Mistra	KNOW
Composition	• Multi-country programme in the global South (South, South-East Asia and Africa) with research consortia (consisting of universities, research institutions, communities, and local and national government agencies)	• Trans-disciplinary research (initiatives) on cities in both the global North and South (consisting of universities, research institutions, communities, and local and national government agencies	• Collaborative, interdisciplinary, in-country and international research teams in both global North and South (consisting of universities, research institutions, communities, and local and national government agencies and NGOs)
Purpose of knowledge co-production	• Integration of disaster risk reduction and climate adaptation methods into development approaches	• To better understand how urban change can work towards realising a more just society	• Addressing the challenge of urban equality in selected cities in the global South (with a focus on redistributive and integrated actions to address prosperity, resilience, and extreme poverty)
Approach to co-production (method)	• Collective activities between members of consortia including exchange visits, multi-media peer-review, training and regular meetings tailored for each consortium	• Multi-stakeholder approach (cross-sector actors from research, practice, and governance together in joint teams) • Experimental research, where partners step out of both institutional and individual comfort zones	• Collective working of teams (research, practice, and governance) in selected cities working through partnerships of equivalence, shared decision-making, mutual trust and respect • Establish in-city and regional Urban Learning Hubs
Approach to knowledge co-production	• Generate new knowledge, evidence, and learning on resilience and adaptation • Create shifts in culture, values, methods of respect, appreciation; valuing each partners' engagement	• Create new knowledge for difficult emerging urban challenges • Build on communicative, organisational and financial cooperation that goes beyond individual knowledge creation processes and projects	• Co-produce knowledge to activate transformations towards urban equality
Tools for guiding co-production of knowledge	• Development and use of Learning Framework to guide co-production process across project	• Establish Local Interaction Platforms – LIPs (in-city multi-stakeholder groups that steer the co-production process)	• Developed monitoring & evaluation frameworks (incorporating and guiding the learning, strategy, activities and outputs)
Role of academic partners	• Facilitate learning, monitoring and evaluation of the programme	• Integrated in LIPs	• Co-ordinate agreed research programmes and facilitate monitoring and evaluation
Management of knowledge co-production	• Dedicated Knowledge Manager role within the consortium documenting evidence and learning on resilience from across the BRACED programme to inform and influence the policies and programmes of practitioners, governments, and funding agencies	• Implied in the work of the LIPs • Centrally-documented (published volumes) of the international network of LIPs	• Work Package (WP1) responsible for documenting the process and evidence of knowledge co-production

Table 1 Summary comparison of co-production of knowledge across BRACED, Mistra Urban Futures, and KNOW.

BRACE. At a glance, the table already demonstrates that co-production is an idea that opens itself to diverse approaches and purposes. The purpose of co-production can be very specific (such as in the case of BRACE) or wider in relation to the transformation of an institutional context in which urban challenges are addressed (such as in the case of Mistra and KNOW). There are, however, a few features that emerge from this comparison. Some are not surprising: co-production efforts tend to take a transdisciplinary approach, valuing the multiple sources of knowledge that inform society; they emphasise collective processes of social transformation in which learning is a core element. More surprising is that the three programmes encounter challenges in the contradictions inherent to knowledge co-production, their provisional, experimental character, and the need to establish mechanisms of accountability within the team that delivers co-production and beyond.

In conclusion, the process of co-production – albeit neither simple nor straightforward and without guaranteed outcomes – can still be seen to have certain features, better described as principles, that enable it to serve the purpose of knowledge production. In terms of its specific application in academic projects, the aforementioned discussion highlights the nature of co-production as being relevant during the conception and entire life-cycle of the project often in temporally overlapping phases. This re-emphasises the idea that co-production cannot be seen as a series of activities but rather a fluid process. Finally, all these generic ideas learned from international experiences miss that ultimately co-production outcomes depend on the contextual setting where co-production processes are implemented. A further contradiction between the aspirations to systematise knowledge co-production and the messiness of co-production in specific urban contexts emerges from this reflection.

How KNOW approaches knowledge co-production for urban equality

KNOW is a project focusing on how to deliver action that moves along a pathway towards urban equality. As Brenner and Schmid (2015: 178) remind us, the urban is understood as "a collective project; it is produced through collective action, negotiation, imagination, experimentation and struggle." In the KNOW project, we focus on knowledge co-production as one strategic means to engage in the collective action required to steer cities on trajectories towards urban equality. This is based on an idea of transformation of everyone involved in the process of co-production in a manner that facilitates a wider process of social learning, that is, learning that challenges collectively held assumptions that impede transformative change towards urban equality.

KNOW proposes a process of 'knowledge in action' which:
1. focuses on knowledge that is immediately relevant to address global and local challenges, building on the tradition of action research in development studies;
2. is sensitive to the diversity of conditions in which urban dwellers find themselves;
3. recognises the multiple ways in which expertise may be produced amongst all actors including vulnerable communities;
4. recognises the transformative capacity of stakeholder engagement in the process of research and institutional capacity building; and
5. based on all of the above, embodies an ethics of practice for urban research.

Underpinning KNOW's approach is a critical appreciation that knowledge co-production may not necessarily deliver urban equality ambitions nor, indeed, that it is the sole means of addressing urban equality. Instead, our task in the KNOW project is to understand how, and under what conditions, can knowledge co-production can help entrench or redirect trajectories towards urban equality. The learnings from other experiences of knowledge co-production described previously are telling; there is a sense that KNOW's success hinges on being able to identify what Freire (2000) called the 'pedagogies of the oppressed' that can change the city.

As we undertake the KNOW research journey, we propose five initial, revisable principles for knowledge co-production in action:

1. Situated – i.e. sensitive to the various, localised configurations of barriers to urban equality regarding the three challenges of achieving prosperity, building resilience to disasters and a changing climate, and addressing the persistent problem of extreme poverty;
2. Strategic – i.e. strengthening capacities to 'read the cracks' and be innovative/ propositional/ transformative in seeking to challenge structural barriers to equality. This is likely to eschew any linear conceptions of pathways to urban equality;
3. Transdisciplinary – i.e. involving many knowledges, but acknowledging the centrality of knowledges from the ground up;
4. Horizontal – i.e. based on partnerships of equivalence in co-production processes. This requires an attention to the complex ethics of co-production, and the multiple power relations at local, regional and global scales;
5. Reflexive – i.e. questions assumptions about practices, incorporates notions of institutional learning, interrogates communities of practice and embraces complexity.

We expect that the experience in KNOW will provide the opportunity to explore the effectiveness of these principles in more detail.

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About KNOW

Achieving sustainable development requires putting a stop to the growing rates of inequality around the world. Knowledge in Action for Urban Equality (KNOW) asks how citizens can be involved in delivering equality in the cities of the future.

KNOW is a 4-year research and capacity building programme (2017-2021) that seeks to promote urban equality in selected cities in Latin America, Africa and Asia. Led by Caren Levy of the Bartlett Development Planning Unit, it brings together an interdisciplinary international team of 13 partners in the UK, Africa, Asia, Latin America and Australia to develop innovative long-term programmes of knowledge co-production for urban equality among governments, communities, business and academia. KNOW is a unique gathering of places, people and their knowledge, innovation and ingenuity. It is funded by ESRC under the Global Challenge Research Fund (GCRF), a £1.5 billion research programme which forms part of the UK Aid Strategy.

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