Mistra Urban Futures Report
2019:2

Mapping of co-creation for social-ecological sustainability in the Stockholm Region

A report from Mistra Urban Futures Stockholm Node

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Contents

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Report Summary

This report investigates the occurrence of *co-creation* processes working to achieve social-ecological sustainability in the Stockholm Region. Co-creation is defined as a process in which different societal sectors, knowledge, experiences, and resources are integrated in order to form a new body of knowledge and new solutions in order to manage complex societal challenges. The tools, strategies, and methods with which processes realise co-creation have been of particular interest.

Relevant processes were selected on grounds of having at least three different sectors involved in joint efforts, working with both social and ecological aspects or from a social-ecological systemic perspective, being on-going at some point during the investigation period and located within Stockholm County. Finally, each relevant process needed to display – directly or indirectly – co-creation as a conscious strategy for realising their objectives. The analysis was conducted by operationalising the concepts of *complexity awareness* and *level of involvement* into three respective levels of co-creation. Complexity awareness was assessed according to the process organisers having: 1) acknowledged the purpose of and need for co-creation (*awareness*), 2) assessed and problematised factors affecting the co-creation process (*awareness* and *critical assessment*), and 3) utilised methods and strategies for mitigating the co-creation process (*awareness*, *critical assessment*, and *structuring*). Level of involvement was assessed according to each participating actor or sector at some point during the process reaching a level of: 1) *informing*: low level (one-way provision of data) 2) *consulting*: middle level (two-way exchange of knowledge and consultation), and 3) *co-producing*: high level (active contribution of resources and knowledge to process outcomes). Furthermore, models based on generality vs. particularity, involvement of local actors, and independent vs. joint participant contribution were constructed based on the findings.

The mapping identified around 150 processes, all presented in this report, and 26 of these were selected for analysis. Thirteen of the 26 selected processes were categorised as practicing co-creation with high-level involvement between four sectors (quadruple helix). Another 12 processes displayed high-level involvement in three sectors, whereas one displayed high-level involvement in two sectors. All 26 processes displayed both a fundamental awareness and a critical assessment of co-creation, while 15 were deemed to be lacking concrete strategies or methods for the co-creation process. The remaining 11 used various explicit and deliberate methodologies, strategies, or approaches to develop a co-creation process, thus displaying a high level of complexity awareness. Equality between actors and knowledge forms, fostering a joint early dialogue for problem formulation, maintaining focus and efficient use of knowledge, ensuring horizontal and transparent organisation, including actors throughout the process, and strong flexibility and adaptability regarding the objectives, procedures, and dispositions of the involved actors were acknowledged as some of the most important paths to successfully engaging in co-creation.

The findings presented here thus indicate that although nearly all of the 26 selected processes display a high level of involvement of different stakeholders, fewer than half (11) approach co-creation in a professional or strategic sense with regards to aspects such as

democracy, inclusion, epistemic equality, and facilitation. Of particular interest is the observation that seven out of the 19 processes (of the selected 26) working with groups of unorganised citizens, i.e. the least influential actors, deploy strategies or methods for inclusion and for managing power relations between these and other actors.

Furthermore, those processes that do actively structure their co-creation process show little regularity. A smaller variety of existing methodologies or approaches have been applied, among them Design Thinking, citizen research, and LEADER. Apart from utilisation of co-creation methodologies, or lack thereof, co-creation in general appears to be a field of relatively low professionalisation and awareness. The use of concepts and the professional orientation of process managers and facilitators vary significantly, clearly reflecting the diversity of knowledge, thought styles, experiences, and language use present in these contexts. This implies a fragmented, unevenly distributed experience and meta-knowledge regarding the co-creation process among the involved actors.

Introduction

From a contemporary standpoint, humanity cannot yet fully comprehend what a sustainable future will look like. Nor are we yet able to appreciate all of the different paths leading toward this future. However, the expertise needed for ascending these paths is, by and large, substantive and abundant. We possess concrete data on our planet's sensitive boundaries. We produce understanding about human social and economic systems and how they interact with ecosystems. We also harbour ample creative potential for using materials in new sustainable ways. Humans gather knowledge on a daily basis about their local environment and the wellbeing of their communities, with or without the incentives for doing so. Consequently, the challenge remains for us not only to use and combine what we know in new ways, but also to sharpen our meta-knowledge on how to do this.

This report is the result of a general mapping of the *co-creation* initiatives for social-ecological sustainability going on right now within the Stockholm Region. By jointly creating knowledge and practical solutions across organisational and sectorial boundaries, these initiatives tackle diverse challenges such as energy, digitalisation, equal inclusion, green infrastructure, viable peri-urban areas, marine resources, urban planning, and so on. The overall objective has been to understand how the inhabitants and organisations of this region can combine their knowledge to achieve the sustainable development goals of Agenda 2030. In this respect, goal 11 (Sustainable cities) has been particularly emphasised.

This report studies the vast diversity of co-creation initiatives from the perspectives of meta-knowledge, the *how* rather than the *what*. This means that rather than observing the concrete impact of co-creation processes on urban social-ecological systems, the report proposes to answer the seemingly fundamental question: "How do these processes work with combining and integrating the diverse knowledge of their participants, and how do they understand themselves in this regard?" For only by learning how to use what we know in effective ways can we expand our common knowledge on how to reach a yet inconceivable sustainable future.

MISTRA URBAN FUTURES AND SNODE

Mistra Urban Futures (MUF) is an international research centre aiming at producing knowledge for sustainable cities, and it currently maintains platforms in four European urban regions (Sheffield-Manchester, Göteborg, Skåne region, and Stockholm) and two African cities (Kisumu and Cape Town). Working according to the vision "Sustainable urbanisation where cities are accessible, green and fair"[1], MUF devotes a substantial part of its operations to *co-production/co-creation of knowledge* and *transdisciplinary research* as means to achieving this vision, and these theoretical and practical approaches are regularly conducted, taught, and researched within the centre. MUF is funded by Mistra, the

[1] https://www.mistraurbanfutures.org/en/how-we-work/vision Accessed 9 April 2019; Simon, David. 2016. "Introduction". Simon, David (ed.). *Rethinking Sustainable Cities: Accessible, Green and Fair.* Bristol: Policy Press.

Foundation for Environmental Strategic Research, which is in turn funded by the Swedish Development Agency (SIDA). The Stockholm Node (SNODE) of MUF was founded in 2017 with the objective of establishing a regional forum for co-creation and knowledge exchange regarding sustainable urban development between actors in the Stockholm Region.[2] As a minor part of the international MUF, SNODE aims to promote co-production of knowledge – also understood as *co-creation* – as an accredited approach to managing social-ecological sustainability challenges within the region. As an initial step towards realising this goal, the 2018-2019 operational document of SNODE presents one of its activities as "a project focusing on gathering information about successful co-creation processes aiming at s*ocial ecological transformations* in the Stockholm Region".[3]

CO-CREATION

Co-creation and co-production[4] are concepts frequently used within contemporary urban development and social service delivery. The two English concepts are regarded as interchangeable in this report, and co-creation will be used henceforth. Co-creation signifies a joint process in which several different groups of experts share creativity, knowledge, and experience in order to manage a certain problem, develop a certain product or service, and/or to produce a new, integrated body of knowledge.[5] There are several possible methods by which this is achieved, and co-creation can be found in various societal contexts. The context of co-creation with which this report will primarily concern itself is the integration of knowledge and expertise from different essential *stakeholders* or need-owner groups into new understandings, solutions, products, and services in order to achieve urban social-ecological sustainability. This appreciation of co-creation stems from the emerging field of transdisciplinary research and the various forms of partnerships and contact areas between academic, private, and public institutions necessitated by an increasing need for innovative and informed responses to complex societal challenges. Co-creation has a disseminated conceptual history, emanating from three different academic

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[2] Mistra Urban Futures Stockholm Node. 2017. *Feasibility Report, March 2017*. 5.

[3] Operational document for Mistra Urban Futures Stockholm NODE (SNODE) 1st of January till 31st of December 2019. 3. Original italics.

[4] Swedish: *medskapande, samskapande, samproduktion* or *samkunskapande*. *Medskapande* is, however, used somewhat differently than the other three, referring mainly to citizen-participatory development processes rather than, for example, producing knowledge between research and practitioners. Hemström, Kerstin. *Verktyg för gemensam kunskapsproduktion: Exempel från Mistra Urban Futures plattform i Göteborg 2010-2016*. Mistra Urban Futures Report 2018:2.

[5] Holmström, Inger K. et al (eds.). 2016. *Samproduktionens retorik och praktik: inom området hälsa och välfärd.* Lund: Studentlitteratur; Ostrom, Kerstin & Davis, Gina. 1991. "A Public Economy Approach to Education: Choice and Co-production". *International Political Science Review* vol. 12 no. 4. 313-335; Aligica, Paul D. & Tarko, Vlad. 2013. "Co-production, Polycentricity, and Value Heterogeneity: The Ostrom's Public Choice Institutionalism Revisited". *The American Political Science Review* vol. 107 no. 4. 726-741; Westberg, Lotten et al. 2013. *Mistra Urban Futures Manual of Joint Knowledge Production for Urban Change*. Gothenburg: Mistra Urban Futures. 4-5.

disciplinary fields, namely sustainability, science and technology studies, and public administration.[6]

PREVIOUS MAPPINGS AND REPORTS

Several related mappings of sustainable co-creation activities have been conducted, but with limited coherence with regards to scope and perspective. Parsons DESIS Lab (part of The New School in New York City) mapped public innovation places, or policy labs, on an international level in 2013.[7] Sveriges kommuner och landsting (SKL) in collaboration with Stiftelsen Svensk Industridesign (SVID) published a report from a mapping of lab environments (such as policy labs and urban living labs) in 2017. The report covers eight environments in Europe, North America, and various international initiatives within the EU and UNICEF.[8]

Extensive research and mapping regarding on-going co-creation processes in Sweden has previously been conducted by MUF, for example, in the contexts of Gothenburg and Skåne. These mappings studied, for example, the conditions for establishing and conducting partnerships across sectors for urban development.[9] MUF also produced the *Kunskapsagendan* (The Knowledge Agenda) for sustainable urban development in 2016 based on studies involving representatives from Gothenburg, Malmö, and Stockholm. The agenda partially focuses on the cross-sectorial aspect of urban development.[10] Other similar mappings of sustainable innovation, testbeds, and best practices include the 2017 report from Grön Bostad on knowledge from the housing sector.[11] Participatory planning processes are covered in, for example, the Uppsala University report on the SKL project for participatory dialogue on complex societal issues.[12]

However, given the diverse contextual conditions regarding co-creation, the accumulated abstract knowledge on the subject can only partly aid the acceleration of co-creation processes in a particular urban region. A contextual understanding is equally

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[6] Miller, Clark A. & Wyborn, Carina. 2018. ”Co-production in global sustainability: Histories and theories”. *Environmental Science & Policy* (article in press).

[7] http://nyc.pubcollab.org/public-innovation-places/ Accessed 17 June 2019.

[8] Sveriges Kommuner och Landsting. 2017. Innovation i offentlig verksamhet: *Innovationslabb för samhällsutveckling.*

[9] See Hemström. 2018; Similar mappings and studies conducted within the MUF context can be found for example on https://www.mistraurbanfutures.org/en/project/knowledge-exchange; https://www.mistraurbanfutures.org/sv/projekt/partnerships-sustainability Accessed 13 June 2019.

[10] Mistra Urban Futures. 2016. *Kunskapsagenda för hållbar stadsutveckling.* Gothenburg: Chalmers University of Technology.

[11] Karlsson, Anja, Adolfsson, Ida, Lätt, Ambjörn & Strandberg, Johan. 2017. *Erbjudande och erfarenheter från befintliga testbäddar inom bostadssektorn*. Stockholm: IVL; see also RISE. 2017. *Testbäddar inom RI.SE. Mars 2017.*

[12] Hellquist, Alexander & Westin, Martin. 2018. *Medborgardialog om komplexa samhällsfrågor: delrapport 2 från följeforskarna.* Uppsala: Uppsala University.

necessary in order to understand the implications for future sustainable co-creation operations in the Stockholm Region.

The operations of projects in the Stockholm Region funded by the EU structural funds have been mapped for the period 2014–2020.[13] The Vinnova-funded Stockholm innovation platform for sustainability (IPHS) has, along with five other local platforms within this Vinnova programme, been evaluated from the perspective of cross-sectorial procedures and their implications.[14] A specific mapping of innovation systems within urban building processes in the City of Stockholm was also finished in 2018, briefly covering some of the projects and platforms also featured in this report.[15] The ARTS project 2014–2016 featured a substantial mapping of local initiatives for sustainability, implying a vast diversity as well as a lack of knowledge exchange between these processes.[16]

DISPOSITION OF THE REPORT

The introduction is structured by first presenting the Stockholm Region's particular dispositions, followed by a brief introduction on the concepts of complexity and social-ecological sustainability. Following this, a more detailed review on the contexts, theoretical perspectives, and examples of co-creation is presented, and then selected methods for the mapping and investigation process are outlined.

THE STOCKHOLM REGION

The Stockholm Region has three levels of public governance – municipalities, counties, and county administrative boards. The City of Stockholm moreover employs city districts as a fourth level due to its vast population and scattered spatial structure. City districts manage local pre-schools, refugee reception, and parks and public spaces among other things. Municipalities are governed by the democratically elected *kommunfullmäktige* (city council). Among their responsibilities is the planning and initiating of city development projects, managing elderly care and social services, water and waste management, and elementary education. Counties are also governed by a democratically elected *landsting* (county council). Their main responsibilities are health and dental care, public transport, and regional planning. Finally, County Administrative Boards are national authorities with the task of ensuring that the government and parliamentary objectives are met in each region. Among their responsibilities are infrastructural planning, emergency readiness,

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[13] Örtquist, Jonas. *Lägesbeskrivning Strukturfonderna 2014-2020.* Länsstyrelsen: Strukturfondspartnerskapets sekretariat.

[14] Stoltz-Ehn, Anna-Karin, Lööf, Jenny & Quistgaard, Louise. 2017. Leda och organisera innovation för hållbara städer och samhällen: erfarenheter från innovationsplattformarna Borås, Göteborg, Kiruna, Lund, Malmö, Stockholm. Stockholm: RISE.

[15] Hovlin, Karin & Jakobsson, Jon. 2018. Stockholms stads innovationssystem inom stadsbyggnadsområdet. En kartläggning. Stockholm: Governo.

[16] Borgström, Sara (ed.). 2016. Att växla upp hållbarhetsarbetet i Stockholmsregionen: En färdplan från ARTS-projektet.

control of food production, animal protection, wildlife care, and sustainable planning. From 1 January 2019, the Stockholm County Council overtook several additional responsibilities from the Stockholm County Administrative Board, officially transforming the county into an administrative *region*, which had hitherto not been the case.

The social-ecological disposition of the region is generally advantageous. The particular challenges in the region concern segregation, housing shortage, education, an ageing population, and aging infrastructure. General health and life expectancy rates have increased steadily for several decades, but social differences have accelerated to the point where, for example, in the City of Stockholm the life expectancy is 8 years higher in the wealthy district of Östermalm compared to the less prosperous district of Skärholmen. While the socio-economically challenged areas of Rinkeby and Tensta – part of the particularly challenged Swedish "Urban 15" group – have experienced a decrease in the number of residents on social welfare, the median income of the wealthiest area in the City of Stockholm is now 4 times higher than that of the poorest, compared to 2 times higher in the early 1990s.[17]

Stockholm was the first city ever to be appointed a European Green Capital (2010). It is a leading urban actor with regards to greenhouse gas emission reduction, mainly due to its district heating and remote cooling management practices and the *trängselskatt*, a congestion charge. In addition, economic growth is steadily increasing.[18] The environmental regional goals are relatively ambitious, both in the short and long term. For example, in 2021 greenhouse gas emissions will have decreased by 75% compared to 1990 and 95% of county-owned transports will be running on renewable sources. By 2050, net emissions in the region will be down to zero.[19]

A regional climate and energy strategy, developed by the government and County Administrative Board, was approved by 22 of the 26 municipalities in the region. However, considering that much of the region's industry has moved abroad, the high level of carbon emission reduction needs to be viewed critically. Moreover, climate change, air quality, diminishing green areas, and the vast challenges of the Baltic Sea on the eastern fringes of the region are examples of substantial challenges faced by the social-ecological systems (SES) of the region.[20] In conclusion, Stockholm is a relatively stable region in economic and environmental terms, while lagging behind with regards to social justice and well-being and facing rapidly growing challenges with regards to its SES.

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[17] Kommissionen för ett socialt hållbart Stockholm. 2015. *Skillnadernas Stockholm*. 80.

[18] City of Stockholm. 2013. *Grön tillväxt i Stockholm*. 10.

[19] Stockholms Läns Landsting. 2017. *Miljöprogram 2017-2021.* 6-10.

[20] OECD Green Growth Studies. 2013. *Green Growth in Stockholm, Sweden.* 13; Naturvårdsverket. Environmental data. http://www.naturvardsverket.se/Stod-i-miljoarbetet/Vagledningar/Miljoovervakning/Miljodata/ Accessed 14 June 2019.

RESEARCH QUESTIONS

1. How do actors of co-creation processes for social-ecological sustainability in the Stockholm Region perceive co-creation as theory and practice?

2. What are their incentives for utilising co-creation?

3. How do they work to achieve co-creation?

4. What are the factors disrupting co-creation practices? What are the factors supporting these practices?

COMPLEXITY

Co-creation is acknowledged as an essential response to *complex problems.* These problems emanate from *complex systems* with emergent properties that are characterised by being in a state of constant change and on-going interactions across various scales and levels. A complex problem is defined by Dave Snowden as any problem in which several conflicting interests and root causes are intertwined and in which the consequences of attempted solutions cannot be accurately predicted. The economy and the environment are examples of such complex systems.[21] However, the causes of the observed consequences can usually be traced back afterwards, meaning that complex problems are not impossible to manage. In comparison to other types of problems, managing complex problems requires a high degree of responsible experimentation. Equally important, it requires involving the people affected by and affecting the problem, the *stakeholders*, not merely as sources of information, but as participants in creating solutions. In this respect, complex problems differ from *complicated* or *simple problems* for which one can normally utilise a pre-formulated, linear process. Cooking recipes and constructing vehicles are examples of simple and complicated problems.[22] The concept of *wicked problems* was coined in the 196's by German sociologist Horst Rittel, signifying a problem for which there are neither any concrete definitions nor any solutions. Furthermore, information regarding such problems is often diffuse and scattered. These hardly encouraging prerequisites demand a constant tracking and follow-up of the problem as one experiments with solutions.[23]

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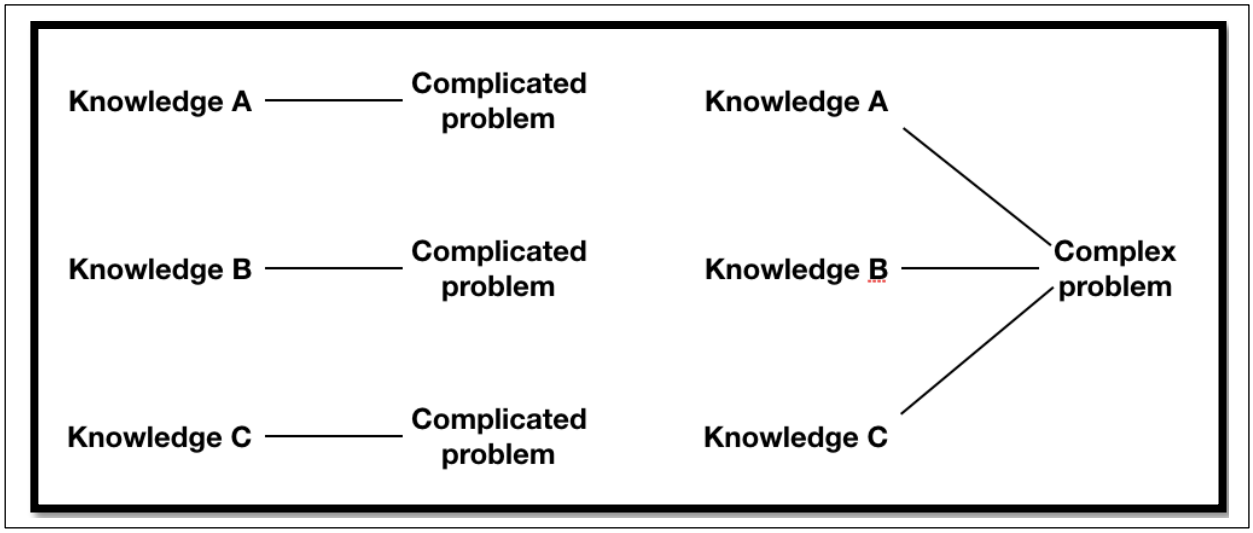
[21] Brouwer, Herman et al. 2016. The MSP Guide: How to Design and Facilitate Multi-Stakeholder Partnerships. UK: Practical Action Publishing. 43-49.

[22] Abrahamsson, Hans. 2015. "Dialog och medskapande i vår tids stora samhällsomdaning". Utbildning & lärande vol. 9 no. 1. 20-21.

[23] Westerlund, Bo & Wetter-Edman, Katarina. 2017. "Dealing with Wicked Problems, in Messy Contexts, Through Prototyping". *Design for Next 12th EAD Conference, Sapienza University of Rome, 12-14 April 2017.* 4.

The development of sustainable cities that are socio-economically just within planetary boundaries is indeed acknowledged as a complex problem, and therefore necessitates new modes of governance and co-creation involving several areas of specialised knowledge – formal, informal, professional, and local – in order to be able to design solutions. It also calls for a sufficiently high level of awareness of the complexity of the particular problem as well as the complexity of the process by which this problem is managed. Complexity awareness is defined by Thomas Jordan as "to what extent a person notices, expects, and can handle the complexity of a task."[24] Merely noticing aspects of complexity does not guarantee a full understanding of the complexity of the issue; however, expecting complexity beforehand makes for a less fragmentary understanding, such as "being aware of the possibility that there might be significant circumstances, causal relationships, potential consequences, and systemic characteristics that might explain occurrences and that might be useful to consider when deciding on a course of action."[25] Moreover, the degree of habit and experience regarding expectations of complex conditions generates "a set of ideas about what circumstances to look for, what explanations might be relevant, what properties of systems might play a role".[26]

Figure 1. Complicated and complex problems.



[24] Jordan, Thomas. 2014. "Deliberative Methods for Complex Issues: A Typology of Functions that May Need Scaffolding". *Group Facilitation: A Research and Applications Journal* no 13. 59.

[25] Jordan. 2014. 60.

[26] Jordan. 2014. 60.

SOCIAL-ECOLOGICAL SUSTAINABILITY

Sustainability is generally defined as a way of existence and living that does not endanger or compromise future generations.[27] Johan Rockström et al. specify variables for planetary boundaries, within which humanity enjoys possibilities of social and economic development and prosperity without endangering the earth's ecosystems and climate.[28] John Dearing et al. develop this framework by integrating social wellbeing into these planetary boundaries as a fundamental variable, coined the "safe and just space".[29] The UN specifies three core elements of sustainable development – economic growth, social inclusion, and environmental protection.[30]

Within this overarching framework, social sustainability refers to a human society's or a community's capacity to hold together in the present and future. This entails equal possibilities for all with regards to movement, leisure, empowerment, welfare services, security, and accessibility. A socially sustainable city, for example, provides safety in public spaces for all. It also provides opportunities for remaining in the same area for as long as one wishes without being forced to move away for economic or other reasons. Measures for social sustainability include diverse housing, conscious planning of public spaces, participatory governance, and diverse and inclusive social activities. More generally, however, social sustainability refers to the overall prospects for contemporary and future well-being of humans within a particular area.[31]

Ecological sustainability refers to the survival and prosperity of ecosystems, as well as the overall survival of the earth and its natural resources. An ecologically sustainable city has a rich biodiversity without risk of losing species or ecosystems and does not produce or consume more resources than the earth can supply. Measures for ecological sustainability include healthy green areas, locally produced food, waste management, energy efficiency, stormwater management and so on.[32]

Social-ecological sustainability can therefore be defined as maintaining a "safe and just space" by managing and protecting natural resources and ecosystems while not compromising social justice but reducing inequalities and increasing equal opportunity for all residents.[33] Aspects of social, economic, and ecological sustainability are, however, not

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[27] The Brundtland Report, World Commission on Environment and Development 1987, cited in Missimer, Merlina. 2015. *Social Sustainability Within the Framework for Strategic Sustainable Development.* Karlskrona: Blekinge Institute of Technology. 1-2.

[28] Rockström, Johan et al. 2009. "A Safe Operating Space for Humanity". *Nature* vol. 461 24 September. 472-475.

[29] Dearing, John et al. 2014. "Safe and just operating spaces for regional social-ecological systems". *Global Environmental Change* vol. 28. 227-238.

[30] https://www.un.org/sustainabledevelopment/development-agenda/ Accessed 14 June 2019.

[31] Magee, Liam et al. 2012. "Measuring Social Sustainability: A Community-centred Approach". Applied Research in the Quality of Life vol. 7. 239-261.

[32] Rockström et al. 2009.

[33] "Eradicating poverty in all its forms and dimensions is an indispensable requirement for sustainable development. To this end, there must be promotion of sustainable, inclusive and equitable economic growth,

as clearly separable from one another as might be implied from the above model. Rather than distinct problem spheres with differing (albeit equally important) implications for sustainable development, viewing them as a *system* offers a more complete understanding of how they affect and interrelate with each other because factors influencing human well-being are inseparable from ecosystems.[34] Recent scholarship has suggested that changes in social relations and the distribution of access to resources affect communities' ecological robustness more than the loss of natural resources.[35] The study of SES emanates from the concept of the biosphere, thereby providing an integrated framework for assessing human communities in a natural environment. Social-ecological sustainability in this sense refers to a condition in which human and non-human components of SES are maintained so that both components' needs are met now and in the future. Urban contexts create particular forms of SES due to the particular challenges posed by dense cities.[36] Actors managing urban contexts require collaboration and a diversity of expertise in order to successfully manage these challenges.[37]

AGENDA 2030

The apprehension of sustainability as presented in this report emanates from Agenda 2030 and the 17 UN global sustainable development goals (SDGs). Agenda 2030 devotes SDG 11 exclusively to the realisation of sustainable cities through inclusion, affordable housing, resilience, safety, functioning transport systems, cultural heritage, reduced pollution, and feasible interconnections with rural and peri-urban areas. The New Urban Agenda[38] further specifies goals and visions for SDG 11 through 175 commitments, several of them mentioning the inextricable importance of joint, multi-stakeholder knowledge production and problem-solving:

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creating greater opportunities for all, reducing inequalities, raising basic standards of living, fostering equitable social development and inclusion, and promoting integrated and sustainable management of natural resources and ecosystems."

https://www.un.org/sustainabledevelopment/development-agenda/ Accessed 5 September 2018.

[34] Daw, Tim et al. 2016. "Elasticity in Ecosystem Services: Exploring the Variable Relationship Between Ecosystems and Human Well-Being". *Ecology and Society* vol. 21 no. 2 art. 11.

[35] Baggio, Jacopo A., BurnSilver, Shauna B., Arenas, Alex, Magdanz, James S., Kofinas, Gary P., De Domenico, Manlio. 2016. "Multiplex Social Ecological Network Analysis Reveals how Social Changes Affect Community Robustness more than Resource Depletion". *PNAS* vol. 113 no. 48. 13708-13709.

[36] Leslie, Heather M. et al. 2014. "Operationalizing the social-ecological systems framework to assess sustainability". *PNAS* vol. 112 no. 19. 5980; Meacham, Megan et al. 2016. "Social-ecological drivers of multiple ecosystem services: what variables explain patterns of ecosystem services across the Norrström drainage basin?". *Ecology and Society* vol. 21 no. 1. art. 14.

[37] Leck, Hayley & Simon, David. 2018. "Local Authority Responses to Climate Change in South Africa: The Challenges of Transboundary Governance". *Sustainability* vol. 10 no. 2542.

[38] https://www.un.org/sustainabledevelopment/cities/ Accessed 1 March 2019.

”41. We commit ourselves to promoting institutional, political, legal and financial mechanisms in cities and human settlements to broaden inclusive platforms, in line with national policies, that allow meaningful participation in decision-making, planning and follow-up processes for all, as well as enhanced civil engagement and co-provision and co-production.”[39]

”153. We will promote the systematic use of multi-stakeholder partnerships in urban development processes, as appropriate, establishing clear and transparent policies, financial and administrative frameworks and procedures, as well as planning guidelines for multi-stakeholder partnerships.”[40]

[39] New Urban Agenda: Draft Outcome of Habitat III. 2016. 8.

[40] New Urban Agenda. 2016. 20.

Contexts of Co-Creation

Co-creation has risen to the surface in the wake of broad societal developments concerning the new role of the public sector and universities as well as the necessity for new organisational procedures in order to respond to complex societal problems.

NEW MODES OF GOVERNANCE

Although cities are governed by the public sector, additional knowledge and resources from all other societal actors are required today in order to realise sustainable urban development. This is part of a wider societal development, codified as *governance,* as opposed to the more traditional *government.* In the governmental model, the state provides the basic welfare and societal services and regulates public spaces and affairs, and decision-makers have sufficient resources and authority to implement large development projects. In the governance system, however, the public sector is reduced to one societal actor among several. Instead of relying on their own resources and knowledge, contemporary public institutions seek to establish and utilise networks of other institutions on a broad scale in order to meet societal demands. This model furthermore seeks to support citizens in becoming more active participants in political affairs in between elections, an ambition supported in public investigations.[41]

This development has received its share of critique. Hans Abrahamsson concludes: "The legitimacy of the political system is considered under threat due to the democratic deficit resulting from the establishment of a governance network-based society, in which decisions are increasingly being made through various forms of partnership, often beyond the public eye."[42]

Governance is connected to other development patterns beginning in the 1980s such as the New Public Management (NPM) model, in which public companies and services are viewed as competitors of their private counterparts, resulting in the introduction of business-like models and operations in public working places.[43] The NPM model has received severe critique over the last decades for steering towards an overly fixated mind-set of cost-saving in welfare services, but also for disrupting co-creation and participatory processes.[44]

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[41] SOU 2016:5. 2016. Låt fler forma framtiden! Betänkande av 2014 års Demokratiutredning – Delaktighet och jämlikt inflytande. Stockholm: Statens offentliga utredningar.

[42] Abrahamsson. 2015. 23.

[43] Abrahamsson. 2015. 24.

[44] Abrahamsson. 2015. 30.

Because wicked or complex problems within urban SES demand new modes of governance, emergent societal processes demand new professional roles.[45] In Swedish discourse on public governance, *hängrännor* ("gutters") has been put forward in recent decades in contrast to *stuprör* ("silos"). This means that in order to combat environmental and social challenges municipal and other public operations need to organise themselves in a more process-oriented manner (i.e. gutters) rather than in isolated routine procedures (i.e. silos). This further implies a more knowledge-integrating form of working, operating beyond conventional departmental and organisational boundaries, but also, equally importantly, across main societal sectors such as academia, civil society, and the private and public sectors. Hence, the term *gränsgångare* ("boundary crosser") has recently been coined to describe the new professional role demanded by multi-organisational and multi-expertise processes.[46]

The current governance model does not fully support a transition towards sustainable cities. Aspects still suffering from under-development include connecting and coordinating a variety of sustainable activism and innovation processes well as a simultaneous need for allowing for local diversity of initiatives.[47] Another quite different aspect, yet evidently corresponding to the development of NPM, is the, in a Swedish context, notoriously coined "project-ification" (Swedish: *projektifiering*) of public organisational innovation and development. This development, identified by research as a management "fad" or trend, means that re-organisational initiatives and innovative developments of public operations are managed as limited projects rather than as operational and organisational transformations on a larger scale. The long-term effects of projects with regards to public governance are seemingly rare because outcomes are seldom followed up.[48]

PARTICIPATORY CITIZENS

Participatory dialogue (Swedish: *medborgardialog*) has received much attention in recent years. This is particularly present in the on-going discussion about sustainability efforts because many of these efforts are dependent on the commitment and participation of individuals. The participatory dialogue process might differ according to context, but the essence remains a formal invitation for those affected by a particular local issue to be able to influence the decision process and the outcome.

One means for further participation of citizens in public sector affairs is *open government* through increased access to public *open data*. With public authorities releasing

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[45] Wolfram et al. 2016. "Conceptualizing urban transformative capacity: A framework for research and policy". *Cities* vol. 51. 121-130. For the Swedish context, see for example Forsberg, Gunnel & Lindgren, Gerd (eds.). 2010. *Nätverk och skuggstrukturer i regionalpolitiken.* Karlstad: Karlstad University.

[46] Ernits, Heiti. 2018. *Omgiven av gränsgångare: framväxten av nya samverkansroller i offentlig sector.* Borås: RISE/Högskolan i Borås. 4.

[47] Borgström, Sara. 2019. " Balancing Diversity and Connectivity in Multi-level Governance Settings for Urban Transformative Capacity". *Ambio* (not yet issued).

[48] Abrahamsson, Agneta & Agevall, Lena. 2009. "Välfärdssektorns projektifiering: kortsiktiga lösningar av långsiktiga problem." *Kommunal ekonomi & politik* vol. 13 no. 4.

large amounts of information regarding a vast range of societal procedures, citizens have significantly greater opportunity to gather the data they need in order to influence issues with which they concern themselves. Currently, however, this is not always the case because not all public actors are providing open data equally or recognising the benefits of such data.[49]

However, there is little agreement as to whether citizens benefit as co-governors or if their participation contribute at all to societal improvement. Participatory dialogue and open government have been criticised as the exit of public decision-makers from their fundamental societal responsibilities. According to critics, involving citizens in decision-making rarely contributes to achieving concrete goals, but rather to maintaining public trust in the political system, at least in a short-term perspective.[50] Some critics even refer to it as "an advanced technique of the post-welfare and authoritarian governance, control and surveillance that individualizes policy-making by pushing responsibility onto citizens".[51] Moreover, involving citizens in co-creating public services for building trust and improving service quality has shown to be highly dependent on organisational support and individual commitment; if these conditions are not effectively realised, trust in the service provider and fellow participants decreases.[52] Other studies indicate the necessity of paying heed to power relations and distinguishing between inspiring and empowering joint visionary work.[53]

THE NEW PRODUCTION OF KNOWLEDGE

In academia, societal development has posed different but equally dramatic challenges and changes. Intellectual property has become increasingly commodified, and demands for the societal applicability of scientific knowledge has been more and more emphasised. These new structural preconditions for conducting research have opened up new arenas, or exchange zones, for collaboration between practitioners and researchers.[54] One umbrella

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[49] Computer Sweden 9/1 2018. Karin Lindström, "Företag frustrerade över öppna data - motarbetas av myndigheterna". https://computersweden.idg.se/2.2683/1.695727/oppna-data-myndigheter Accessed 10 June 2019.

[50] Werner, Jeff. 2018. *Postdemokratisk kultur.* Möklinta: Gidlund. 32-33.

[51] Tahvilzadeh, Nazem. 2015. "Understanding Participatory Governance Arrangements in Urban Politics: Idealist and Cynical Perspectives on the Politics of Citizen Dialogues in Göteborg, Sweden". *Urban Research & Practice* vol. 8, no. 2. 241.

[52] Fledderus, Joost. 2015. "Building trust through public service co-production". *International Journal of Public Sector Management* vol. 28 no. 27. 559-562.

[53] Krzywoszynska, Anna et al. 2016. "Co-producing energy futures: impacts of participatory modelling". Building, Research & Information. 10.

[54] Nowotny, Helga, et al. 2003. "Introduction. 'Mode 2' Revisited: The New Production of Knowledge". Minerva vol. 41. 183, 191.

term coined for denoting this new state of research is *Mode 2*.[55] There currently exists a diversity of models for understanding the interface of public-academic, private-academic, and public-private-academic knowledge production and interaction. The interface of science and policy has become increasingly highlighted and problematised regarding the impact of researchers on policy development. It remains clear that a basic knowledge transfer from science to public actors is insufficient to affect public policy, thus urging researchers, civil servants, and other key stakeholders to collaborate more intensely.[56]

As academia and society are brought more closely together, the past two decades have brought an increasing emphasis on academic contributions to economic growth through commercialisation of innovation and research outcomes. This, naturally, raises important questions of academic freedom, as well as whether research can be considered an asset or a threat to sustainable development because economic development is problematic in relation to – at least – ecological sustainability and climate change.[57]

In 2016, the Swedish government initiated a demonstration of strength regarding innovation and collaborative partnerships for – among other areas – sustainable development. The initiative, called *Testbädd Sverige* ("Testbed Sweden") entailed 845 000 000 SEK directed to the funding of testbeds all over the country and was used as an incentive for counties and cities to further accelerate testing of new solutions.[58]

Historically and internationally, urban sustainability initiatives involving multitudes of stakeholders are often characterised by exclusion of one or several perspectives. Co-creation does not guarantee socially informed or democratically produced knowledge. Moreover, policies and collaborations around sustainability risk being hijacked by techno-economic interests promoting the status quo rather than actual transformational efforts.[59]

COLLABORATION AND CO-CREATION

Co-creation is not necessarily equivalent to any form of trans-sectorial or multidisciplinary *collaboration, synergy* or *co-operation* (Swedish: *samverkan*), in which a partnership or team either works together to manage specific problems or constitute an on-going collaborative structure for dialogue and knowledge exchange. In Swedish, however, the word *samverkan* literally means "joint action" or "joint effect", somewhat emphasising the impact of the collaborative effort. *PPP* (Public-private partnership) and *P2P* (Public-to-

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[55] Nowotny et al. 2003. 186; Gibbons, Michael, et al. 1994. The New Production of Knowledge. The Dynamics of Science and Research in Contemporary Societies. London: Sage. 2-3.

[56] Dunn, G. et al. 2018. "Mediating the science-policy interface: Insights from the urban water sector in Melbourne, Australia". Environmental Science and Policy vol. 82. 144.

[57] Angelstam, Per, et al. 2013. "Solving Problems in Social–Ecological Systems: Definition, Practice and Barriers of Transdisciplinary Research". Ambio vol. 42 no. 2. 254.

[58] https://www.regeringen.se/pressmeddelanden/2016/09/845-miljoner-kronor-till-en-kraftsamling-for-innovation/ Accessed 11 December 2018.

[59] May, Tim & Marvin, Simon. 2017. "The future of sustainable cities: governance,

policy and knowledge". Local Environment vol. 22 no. 1. 5-6.

public partnership) are two of the most commonly acknowledged forms. The originally British concept of *partnering* or *strategic partnering* (a similar term being *extended collaboration,* Swedish: *utökad samverkan*) constitutes a similar form of two or more actors co-working closely and transparently to realise a shared agenda, usually through a temporary project. Strategies used in partnering and extended collaboration include integrated teams and co-creation of strategies and visions between involved actors. These solution models are usually present in complex urban construction projects involving procurement of entrepreneurs and are meant to facilitate a desired outcome for both clients and providers of a certain product or service.[60] Although collaborative partnerships might very well use co-creative mechanisms in theory and practice, co-creation in itself does not require formalised partnerships.

AGENCY PROBLEMS

Agency Theory concludes that there is an inherent complex of problems within every organisation just as there is in any contracting situation. The principal assigns an agent to maximise the principal's utility functions, but due to differing interests and differing utility functions, there can never be a completely aligned course of action between the two actors, and this condition is termed the *agency problem*. Thus, contracts are established in order to mitigate this agency problem. The complexity of this relationship is also present in cooperative contexts between organisations, even though there is not one single principal actor.[61]

Co-creation, however, must be understood as a fundamentally different context as opposed to the principal-agent relationship, in which a particular performance is assigned to an agent by a principal or process-owning actor. For co-creation to function, it is acknowledged that no body of knowledge and no particular collective of knowledge are given advantages over the others regarding the process in any of its phases.[62] Therefore, the principal's role ultimately needs to be shared among stakeholders, thus demanding that the process be guided by democratic and egalitarian principles. Nevertheless, the agency problem needs to be addressed in any cooperative process, just as it is inherently present in a hierarchical organisation.

THE POLITICS OF EXPERIMENTATION

In order to manage various complex urban challenges, governing bodies worldwide choose to introduce a range of new means and incentives for accelerating innovation of products,

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[60] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. 2011. *Partnering in Research and Innovation*. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52011DC0572

[61] José Lacruz, Adonai. 2016. "Governance for Partnership Sustainability: An Approach from the Agency Theory". Periz-Ortiz, Maria (ed.). *Multiple Helix Ecosystems for Sustainable Competitiveness.* Switzerland: Springer. 30-32.

[62] Pohl, Christian et al. 2010. "Researchers' Role in Knowledge Co-Production: Experience from Sustainability Research in Kenya, Switzerland, Bolivia and Nepal." *Science and Public Policy* vol. 37 no. 4. 271.

services, and systemic solutions. In this process, governance is itself being innovated while governing innovation.[63]

THE HELIX MODELS

The *triple helix*, coined by sociologist Henry Etzkowitz, signifies a partnership for innovation and societal implementation between academia, the public, and private sectors, whereas the *quadruple helix* adds to these previous three the fourth sector of civil society or citizens. The triple helix model was originally used for visualising alternatives to the traditional patterns of research, in which researchers and scientists produce knowledge in a more or less enclosed field with little or no connection to on-going societal issues.[64] Both models have since come to be intimately connected with innovative industries and innovation science as the best possible prerequisites for producing cutting edge digital solutions, Internet and computer technology (ICT), and the Internet of Things (IoT). Through the helix models, knowledge production is further commercialised and applied to societies and nations.[65] However, research about the consequences, benefits, challenges, and prerequisites of triple or quadruple helix collaboration is still in its youth.

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[63] Bulkeley, Harriet et al. 2017. ”Urban Living Labs: Governing Urban Sustainability Transitions”. *Current Opinion in Environmental Sustainability* vol. 22. 14; Evans, James et al. 2016. “The Experimental City: New modes and prospects of urban transformation”. In Evans, James et al (eds.). *The Experimental City.* London: Routledge. 1-12.

[64], Periz-Ortiz, Maria (ed.). 2016. *Multiple Helix Ecosystems for Sustainable Competitiveness.* Switzerland: Springer. 4, 7.

[65] Askfors, Ylva. 2018. Samverkan för innovation: en fallstudie av mötet mellan akademi, industri och sjukvård. Stockholm: Kungliga Tekniska Högskolan. 6.

Types of co-creation

This section presents a number of practices referred to as co-creation within business, design, urban development, and research.

VALUE CO-CREATION AND OPEN INNOVATION

Numerous examples of involving customers in the design, production, selection, and evaluation stages of a product or service show the potentials of business co-creation vis-á-vis "traditional" production in which enterprises manufacture and provide what they believe to be meeting a demand among a large enough customer group in order to maximise profit. In a co-creative process, the users can contribute their particular needs and prerequisites as well as materials and professional expertise. Together, if successful, they develop a much more customer-adapted version of a product or service.[66] Inter-organisational co-creation and collaborative innovation of products has also emerged as a competitive business advantage.[67]

CO-DESIGN

Originally only consisting of drawing and sketching, design emerged as a field and practice in the 20th century and quickly became a trusted ally of industrial production. Around the turn to the 21st century, many designers attempted to re-discover the essential features of design that they perceived were being lost in excessive marketing. Thus, concepts like *design thinking* were implemented, re-emphasising the theoretical and societal aspect of design. The field of design has subsequently become more focussed on improving societal and human conditions by involving users and considering the lives and needs of people in designing products and services.[68]

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[66] Ramaswamy, Venkat & Ozcan, Kerimcan. 2014. *The Co-Creation Paradigm.* Stanford: Stanford University Press. 1-3; Shrivastava, Ashish et al. 2018. "Lean Co-creation Model Analysis for Manufacturing Industries". *International Journal of Manufacturing Technology and Management* vol. 32 no. 6. 581.

[67] Wu, Li-Wei et al. 2015. "Managing innovation through co-production in interfirm partnering". *Journal of Business Research* vol. 68. 2248-2253.

[68] Aagard, Isabel et al (ed.). 2015. *Democratic Design Experiments: Drawing Things Together with Codesign.* Copenhagen: Royal Danish Academy of Fine Arts, Schools of Architecture, Design and Conservation. 38-39.

TESTBEDS AND URBAN LIVING LABS

Testbeds are limited (space and time-wise) real life environments in which products or services can be tested, either by a limited number of people or by anyone. Urban living labs (ULLs) are open platforms or arenas designed to foster innovation between societal sectors, for example, public and private actors, for solving contemporary urban problems.[69] As a relatively novel feature of the Politics of Experimentation, ULLs still struggle with producing concrete, scalable results while effectively creating environments fostering innovative perspectives among involved societal actors.[70] More research is needed on test and lab environments, not only regarding their societal and systemic impact, but also on the way the design of (for example) ULLs creates new forms of capacity by reassembling resources and actors. Key to understanding the impact or lack thereof among ULLs is an assessment of power dynamics and agency within urban governance systems.[71]

TRANSDISCIPLINARY RESEARCH

Partnerships between universities and cities are acknowledged as essential prerequisites for transferring solutions for sustainable development,[72] and no single form of knowledge or skill is considered sufficient. Therefore, today's sustainability challenges call for joint efforts from various experts and traditions of knowledge in order to innovate new solutions to generate the experimentation that is needed. A joint production of knowledge between research and practice is considered a prerequisite for achieving more societally relevant and holistic solutions.[73] Researchers of various disciplines approach practitioners, i.e. employees and volunteers working with the problem on a daily basis, as well as individuals experiencing the problem first hand. Such states of knowledge production are described as *transdisciplinarity*, differing from *interdisciplinarity* and *multidisciplinarity* (which only concern the academic sphere).[74] The implementation of many currently needed functions in cities, such as green infrastructure, are considered to require transdisciplinary research approaches in order to be successful.[75] This form of research brings other groups than researchers forward in presenting definitions of and solutions to problems. For example, transdisciplinary case studies in African cities have highlighted the importance of local

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[69] Bulkeley et al. 2017. 14.

[70] Gascó, Mila. 2016. "Living Labs: Implementing Open Innovation in the Public Sector". *Government Information Quarterly* vol. 34. 96; Bulkeley et al. 13-14.

[71] Bulkeley et al. 2017. 16.

[72] Keeler, Lauren Withycombe et al. 2018. "Transferring Sustainability Solutions across Contexts through City–University Partnerships". *Sustainability* vol. 10. no. 2966. 1-2.

[73] Hemström. 2018. 8.

[74] Cumming, Graeme S. 2014. "Theoretical Frameworks for the Analysis of Social-Ecological Systems" in Sakai, Shoko & Chieko Umetsu (eds.). *Social-Ecological Systems in Transition*. Japan: Springer. 5-6.

[75] Angelstam et al. 2013. 260.

empowerment and communication between public actors and local communities in order to successfully extend urban support systems in an equal manner.[76]

The principal value for researchers generated from transdisciplinary research is the participatory form of investigation and process therein, generating more substantial results. However, this process puts substantial demands on maintaining scholarly integrity, critique, and distance because the researcher is often embedded in a local, subjective context.[77] Other challenges of transdisciplinary research include the difficulty of tracking the societal impact of conducted research while maintaining the qualitative evaluation of utilised methodologies.[78] Moreover, as in many multi- or interdisciplinary settings, uniting epistemologies operating according to fundamentally different thought traditions requires different approaches than those of basic research. The natural sciences expect universality, objectivity, predictability, and empirical stability, whereas the social sciences accept contextuality, arbitrariness, and contesting epistemologies in relation to their objects of study.[79] This is due to human behaviour not being possible to predict in the same way as mathematical and natural phenomena.

The transdisciplinary process has been systematised into three modes of knowledge production, or *levels of intensity of involvement*, because it is unlikely that all participants could or should be involved equally along the whole research process. This model, derived from Gene Rowe and Lynn J. Frewer's concept of "level of public participation"[80], has been developed by Michael Stauffacher et al. and applies various levels of involvement, also allowing for complementary comparison with levels of formalisation.[81] As researchers and practitioners interact in producing societally relevant knowledge, the level of involvement might vary according to contextual needs and prerequisites. Malin Mobjörk distinguishes between *consulting* versus *participatory* transdisciplinarity. The former

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[76] Tvedten, Inge & Candirac, Sara. 2018. "'Flooding our eyes with rubbish': urban waste management in Maputo, Mozambique". *Environment & Urbanization* vol. 30 no. 2. 641-644. Keeler, Lauren Wythcombe et al. 2018. "If citizens protest, do water providers listen? Water woes in a Tanzanian town." *Environment & Urbanization* vol. 30 no. 2.

[77] Perry, Beth & Atherton, Mark. 2017. "Beyond Critique: The Value of Co-Production in Realising Just Cities?". *Local Environment*. 2.

[78] Lang, Daniel J. et al. 2012. "Transdisciplinary research in sustainability science: practice, principles, and challenges". Sustainable Science vol 7 no 1. 39.

[79] Baumann, Henrikke. 2009. "Don't fence me in". In Boons, Frank & Howard-Grenville, Jennifer (eds). *The Social Embeddedness of Industrial Ecology*. UK: Edward Elgar.

[80] Rowe, Gene & Frewer, Lynn J. 2005. "A Typology of Public Engagement Mechanisms". *Science, Technology, & Human Values* vol. 30, no. 2. 255.

[81] Stauffacher, Michael et. al. 2008. "Analytic and Dynamic Approach to Collaboration: A Transdisciplinary Case Study on Sustainable Landscape Development in a Swiss Prealpine Region". *Systemic Practice and Action Research* vol. 21 no. 6. 414-415. See also Pohl, Christian, Krütli, Pius & Stauffacher, Michael. 2017. "Ten Reflective Steps for Rendering Research Societally Relevant" in *GAIA (1)*. 50.

consists of practitioners responding to already conducted research, whereas the latter implies a more equal research process involving all actors.[82]

SUMMARY

Co-creation is a diverse and deeply ambiguous concept with several synonyms and adjacent terms rooted in different academic and professional traditions and fields. In this report, co-creation refers to the joint creation of knowledge and practical outcomes between several thought traditions, forms of expertise, and means – both practical and intellectual – in order to overcome the complex challenges of social-ecological sustainability. Carina Wyborn and Clark Miller concludingly state:

> *”Co-production is an inevitable and ubiquitous feature of modern societies. It cannot not happen. The only question is how it is designed and practiced, what practices and processes get used, and therefore which producers play what roles (i.e., how power is allocated) and what products (i.e., knowledge, people, and socio-ecological arrangements) emerge as a result. If one wants different co-products—say, more globally sustainable institutions and outcomes—then it will be necessary to create new co-producers and new co-production processes and performances to make and remake the world anew each day. It isn’t enough to just make new knowledge.”*[83]

[82] Mobjörk, Malin. 2010. ”Consulting versus Participatory Transdisciplinarity: A Refined Classification of Transdisciplinary Research”. *Futures* vol. 42. 866-873.

[83] Miller, & Wyborn. 2018. 7.

Methods

THE CONCEPT OF PROCESS

As an analytical category, the concept of *process* was chosen as an overarching signifier for the initiatives, projects, platforms, and activities being mapped and studied in this report. Process[84] is here defined in the most general way, namely as a set of activities linked together through a course of action or progress, reaching or aiming for a destination.

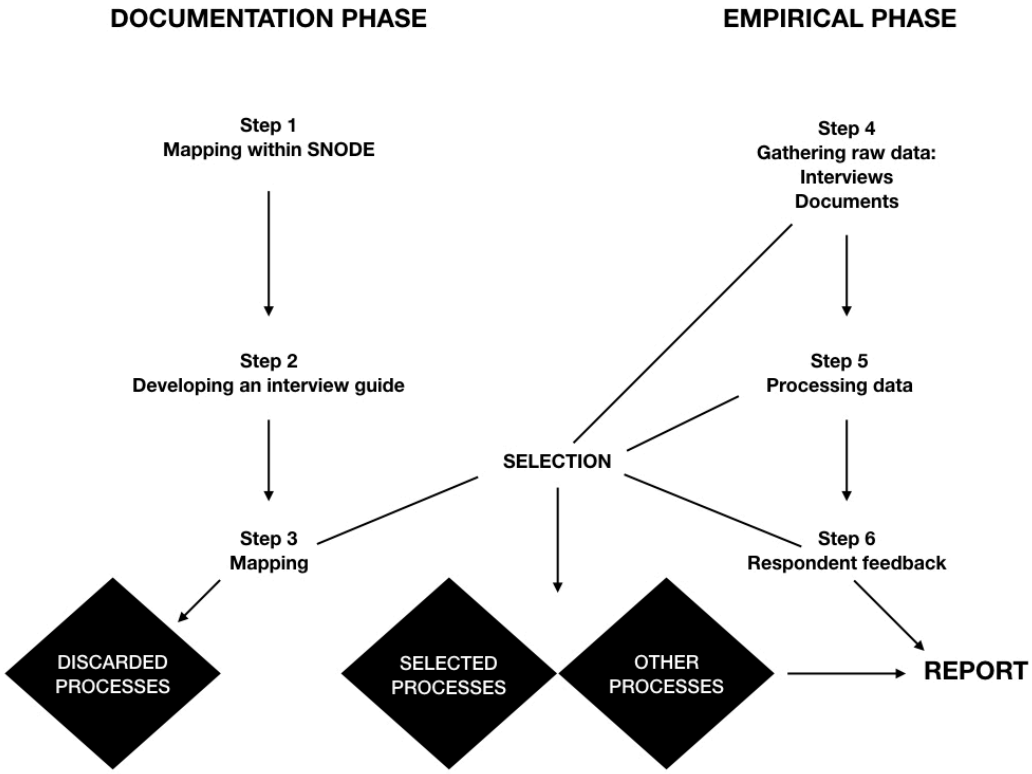
RESEARCH QUESTIONS

How do actors of co-creation processes for social-ecological sustainability in the Stockholm Region perceive co-creation as theory and practice?

1. What are their incentives for utilising co-creation?
2. How do they work to achieve co-creation?
3. What are the factors disrupting co-creation practices? What are the factors supporting these practices?

[84] Compare to Latin *procedo*: ”advance”, ”proceed”.

Figure 2. The process of mapping.



A sequence of six steps was followed in order to map all possible relevant processes and to answer the above research questions. The first step consisted of interviews with representatives within the steering group of SNODE,[85] and they were asked to give examples of co-creation, both as a phenomenon and as concrete cases, often ones where they had participated themselves. They were also asked to describe challenges, possibilities, and strategies characterising these examples. Parallel to this process, research on co-creation and co-production of knowledge was studied in order to gain a broad comprehension of the phenomenon. In the second step, a standard interview guide was agreed upon between the research assistant and the steering group. In the third step, initiated after the first and second stage and continuing throughout the project, a mapping of potential processes and contact persons according to the research criteria was carried out using Internet searches and recommendations from the steering group. In the fourth step,

[85] The SNODE steering group during the period of investigation consisted of Lukas Smas, Zahra Kalantari (Stockholm University), Erik Andersson (Stockholm Resilience Centre), Sara Borgström, Erik Stenberg, Johan Högström (KTH), Elin Andersdotter Fabre (Global Utmaning), Maja Brisvall (Quantified Planet), Åsa Romson (IVL), and Ivar Björkman (Openlab). All except Ivar Björkman, Johan Högström, and Maja Brisvall were interviewed.

interviewees were approached and semi-structured interviews conducted. The fifth step consisted of analysis and structuring of the data obtained from the interviews, from official material produced by each process (e.g. reports), and from complementary sources. Finally, in the sixth step feedback was gathered from all interviewees on drafts regarding their particular processes (as depicted in the Appendix) in order to ensure robust empirical data.

SELECTION AND CRITERIA

The fundamental criteria for the selection of processes concerned duration, location, social-ecological relevance, and actor constellation. Duration required that a process was not finished. However, certain interesting processes discovered during the mapping that had recently finished were saved in a separate database. Location required processes to be based in and/or operating within the Stockholm Region, i.e. Stockholm County.

For social-ecological relevance, the official description of a process needed to include efforts and/or a purpose corresponding to the United Nations 17 SDGs of 2015. It was, however, not necessary for processes to explicitly state both social and ecological efforts or to explicitly mention particular SDGs because this could be further determined based on interviews and further research data.

Social-ecological sustainability efforts were defined in correspondence to the UN Sustainable Development Agenda – a process of sustainably managing and protecting natural resources while not compromising social justice but reducing inequalities and increasing equal opportunity for all.[86]

With regard to the targets of each SDG, SDGs 1–5, 10, and 16[87] were defined as exclusively concerning social sustainability, whereas those remaining (6–9, 11–15, and 17)[88] were defined as corresponding to the conditions for social-ecological sustainability according to their respective specific sub targets. Out of these, SDG 11, Sustainable cities, was assigned particular relevance based on the overall focus of MUF.

Regarding actor constellation, participating actors (if visible) were required to hail from at least three different societal sectors. Preferred partnership constellations were either triple helix (academia-private-public sectors) or quadruple helix (academia-private-public-civil sectors). While acknowledging the simplifying aspects of the helix models, they were

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[86] "Eradicating poverty in all its forms and dimensions is an indispensable requirement for sustainable development. To this end, there must be promotion of sustainable, inclusive and equitable economic growth, creating greater opportunities for all, reducing inequalities, raising basic standards of living, fostering equitable social development and inclusion, and promoting integrated and sustainable management of natural resources and ecosystems." https://www.un.org/sustainabledevelopment/development-agenda/ Accessed 5 September 2018.

[87] 1) No poverty; 5) Gender equality; 10) Reduce inequality within and among countries; 16) Promote just, peaceful, and inclusive societies. https://www.un.org/sustainabledevelopment/sustainable-development-goals/ Accessed 5 September 2018.

[88] 2) Zero hunger; 3) Good health & well-being; 4) Quality education; 6) Water and sanitation; 7) Affordable and clean energy; 8) Decent work and economic growth; 9) Industry, innovation and infrastructure; 11) Make cities inclusive, safe, resilient and sustainable; 12) Responsible consumption and production; 13) Take urgent action to combat climate change and its impacts; 14) Conserve and sustainably use the oceans, seas and marine resources; 15) Life on land; 17) Partnerships for the goals. Ibid.

valuable selection principles for ensuring that the level of co-creation was sufficiently high because two sectors alone did not combine enough diverse knowledge to be selected for investigation. However, other varieties of these constellations were also deemed interesting and therefore collected into the same database as the others. When encountering processes based solely on municipal-citizen or private-public collaboration, for example, these were immediately discarded as less relevant yet interesting to the mapping, and thus collected in a separate database.

MAPPING PROCESS

Databases from project funding agencies were among the most relevant sources of data because they offer accessible overviews of collaborative processes, focus areas, and participating organisations. Thus, a substantial part of the mapping targeted the largest funders in Sweden for sustainability projects.

1. Websites of municipalities and universities in the Stockholm Region listing on-going projects, collaborations, city developments, infrastructures, and initiatives for sustainability.

2. Websites of actors and processes derived from interviews with the steering group and actors from co-creation processes as well as professionals' e-mail addresses and telephone numbers. All interviewees were asked to provide recommendations for future investigation if possible.

3. Google search using the words "*co-creation sustainability*", "*co-creation stockholm region*", "*social-ecological sustainability stockholm*", "*co-creation sustainability stockholm*" and "*co-creation social-ecological sustainability stockholm region*" (in both Swedish and English).

4. Vinnova project database search using the words "*sustainability*", "*social-ecological sustainability*", "*co-creation*", and "*co-creation sustainability*" with the selection of search results within the Stockholm Region. Also, a general search was made of on-going projects in the same database.[89]

5. EU project database search, including structural funds and Interreg projects, targeting projects including actors based in the Stockholm region.[90]

6. Naturvårdsverket's (LONA & LOVA) general project database search.[91]

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[89] Vinnova is the national Innovation Funding Agency in Sweden, offering among other things a wide range of strategic programmes assigned for innovation projects for sustainable development. https://www.vinnova.se/

[90] The EU structural funds include the EU Regional Development Fund (Swedish: *ERUF*) and the European Social Fund (ESF). https://ec.europa.eu/regional_policy/EN/funding/

[91] Naturvårdsverket is the Swedish Environmental Protection Agency, offering research and local development project funding. LONA (Lokala Naturvårdssatsningen) is a local voluntary project funding programme. LOVA (Lokala Vattenvårdsprojekt) is a local marine resources project funding programme. Both programmes offer repeated funding yearly. http://www.naturvardsverket.se/

SELECTION CHALLENGES

In many cases, judging the relevance of a process based on website content proved challenging. Therefore, the rule was rather to approach identified processes than not to, even if they might prove less relevant to the investigation. All processes and potential respondents identified during the mapping were collected into a database, and each potential respondent was contacted. Due to the limited time, priority was given to processes with observable correspondence to the selection criteria.

INTERVIEWS

Potential respondents were project managers and other key individuals with practical experience from the process, preferably those suggested on websites as designated spokespersons due to the likeliness of them being most knowledgeable. The respondents were approached by e-mail in order to arrange semi-structured interviews with all standard questions being provided beforehand.

Interviews were recorded when possible, and minutes taken simultaneously for the greatest possible data extraction. When recording was not possible, minutes were carefully taken and respondents were asked to repeat or clarify their responses when needed. The latter format was less preferable although necessary if the respondent did not agree to or could not manage a physical meeting or if they were too remotely located.

STOCKHOLM URBAN FORUM

The conference Stockholm Urban Forum was held on 28 May 2019 and organised by the SNODE. It attracted participants from all societal sectors working with sustainable urban development. Representatives from several of the selected processes were invited to host workshops and to present their work. The outcome of the workshop was included as an additional source of data for analysis in this report.

ANALYSIS OF DATA

Complexity awareness

As stated above, utilising co-creative approaches and methods shows an ambition to engage with a complex issue (such as social-ecological sustainability). It is thus relevant to investigate the degree of *complexity awareness* among the different processes.

Three guiding operationalising questions were utilised to assess complexity awareness regarding co-creation:

1. Do the interviewees and/or process documents acknowledge co-creation as an approach and why it should be used?

   Variables analysed:

Their incentives and necessity for co-creation.
Their strategy and ambition to use co-creation.
Their experienced effects and implications of using co-creation.
Other general reflections about co-creation.

2. Do they acknowledge particular challenges, prerequisites, and needs associated with co-creation processes?

   Variables analysed:
   Their previous experience of obstacles or supporting factors for co-creation processes.
   Their general anticipation of the co-creation process.
   Their general anticipation of the circumstances and systemic properties surrounding the co-creation process.

3. Do they use or develop specific methods with which to facilitate co-creation (regardless of other objectives)?

   Variables analysed:
   Inclusion of different stakeholders; mitigating power asymmetries; democracy.
   Integration of different bodies of knowledge, workshops for formulating joint problem definitions and visions, joint writing of applications, etc.
   Organisation of the process, working packages, etc.
   Design tools, methodologies, and established approaches, facilitation, theoretical starting points, method development, etc.

Depending on answers from the interviewees and the studied material, processes were separated into different sections. Note that this analytical approach did not seek to grade processes in relation to each other, as in "best practice" or "worst practice", because the particular approach to co-creation does not categorically determine the overall outcome of the specific process. The analysis is rather a means for investigating various levels of awareness regarding co-creation as a practice, theory, and craft.

Intensity of involvement

Although co-creation is difficult to assess, a sufficiently adequate standard for analysing degrees of co-creation and co-production of knowledge is the level of *intensity of involvement* or *level of involvement* as presented above. The choice was made to concentrate on the three basic levels of involvement due to the large number of investigated processes.

The most fundamental level of involvement is *informing*, in which actors do not produce or collaborate other than providing other actors with information. The middle level is *consulting*, in which actors actively seek each other's opinion and knowledge. The highest level is *co-producing*, in which actors contribute to concrete products, knowledge, and

solutions. The intensity of involvement varies according to the particular actor, process stage, and required knowledge.[92]

The model of intensity of involvement was applied to the most relevant processes studied. A fourth level was also added, *non-active*, for actors deemed not to be participating in co-creation even though they were formally a part of the process.

Figure 3. Levels of intensity of involvement (operationalisation).

Co-producing (high)	Constructing; organising processes; formulating problems; generating ideas; revising and creating new solutions and knowledge; providing resources to a joint product or service; workshops; implementation.
Consulting (middle)	Evaluation; legal advice; suggestions of process direction; initiating dialogue; interviews.
Informing (low)	Providing facts; gathering and distributing data; presenting the problem; steering.
Non-active	Not producing, consulting, or providing information as observed in the material; absent in the material; adding value or attention to the process by passively supporting from the outside, such as associating their brand or logotype with the process.

The intensity of involvement was subsequently analysed according to type of actor in order to reveal patterns of involvement. Although at times an oversimplification, actors were categorised as either civil (including residents), private, public, academic, or undefined/hybrid.

When studying diverse processes it is particularly important to consistently use relevant and generalisable variables for analysis. Thus, instead of knowledge, this report will concentrate on the exchange of and access to *valuable resources* or *power resources*. What constitutes a valuable resource might differ according to various contexts, with the common denominator being that the resource enables a certain course of action.[93] The processes mapped in this report might emphasise different outcomes; some might indeed focus on producing new knowledge by co-creation, whereas others might focus on producing a

[92] Stauffacher et al. 2008.

[93] Korpi, Walter. 1987. ”Maktens isberg under ytan”. In Petersson, Olof (ed.). *Maktbegreppet*. Stockholm: Carlsson. 93-96.

practical tool or service without much recordkeeping or analysis being made in the process. (Many of them may certainly produce both.)

Thus, expert knowledge, evaluation, and education of certain procedures and essential information and data constitute one type of resource, and funding, materials, venues, platforms (digital and physical), contacts, and networks constitute other equally relevant resources. When analysing the co-creation of the various studied processes, the collected data were assessed with regards to all of these different types of resources.

Operationalising questions:

1. What does each actor, stakeholder group, or sector contribute to the process and outcomes in terms of valuable resources?

2. How are the resources that are valuable to the process contributed by and distributed among the actors?

Inclusion of stakeholders and integration of knowledge

Although knowledge is not the only resource valuable in co-creation, the integration of different knowledge is an essential part of the process that should be studied as a particularly relevant variable. This aspect of co-creation is intimately linked to the inclusion of stakeholders because the equal or unequal valuing of differing epistemologies contributes substantially to the outcomes of knowledge integration processes.[94] This concerns questions of power relations, for example, between citizens and the public administration or between researchers and practitioners. The investigation presented here thus asked whether these conditions within studied processes are actually assessed and brought to awareness, and if so how this is done. Individual citizens, or groups of citizens lacking organised resources, are treated as a particular case in the analysis because they wield less influence over the process unless supported. Processes working with such stakeholders are treated within a separate section of the Analysis with particular attention to question 2 below.

Operationalising questions:

1. In what way are stakeholders within each process involved in integrating outcome and knowledge?

2. How is inclusion and empowerment of stakeholders with less influence, in particular unorganised citizens, managed?

[94] Pohl et al. 2010. 271.

ASSESSING CO-CREATION METHODOLOGIES

Distinguishing whether methodologies and frameworks can be considered co-creation methodologies or not was based on the operationalising questions of whether these approaches contribute to including different stakeholders and integrating knowledge in the process. Because this distinction might at times be obscure, individual assessments need to be made. For example, a methodology or framework *fostering* co-creation with different stakeholders was not sufficient for assessment as a methodology *structuring* the co-creation process. However, because processes might work with a variety of approaches in some way related to their co-creation practice, it was deemed relevant to include the presentation of a full variety of such approaches within the report.

MODEL FOR PRESENTATION

A structured figure for presenting each process was made according to type of actor, level of involvement, and particular contribution to the process and the production of its solutions. For the sake of accuracy, these models were presented to the interviewees for confirmation. Each level of involvement table is featured in the Appendix.

Figure 4. Template for evaluation of selected processes (example).

PROCESS NAME	**Level of involvement**	**Contribution**
Public sector	Co-producing	Organising, problem formulation
Civil sector	Co-producing	Problem formulation
Academia	Consulting	Evaluation
Private sector	Co-producing	Idea generation, materials, facilities
Undefined/hybrid	?	?

MODELS OF CO-CREATION

In order to abstract the common structures of the identified co-creation processes, four different models were developed. The three main dichotomies used to construct these models were 1) generalisability vs. particularity of objectives; 2) the necessity vs. optionality of including local actors, such as citizens; and 3) the jointly vs. independently designed contribution process of the involved actors.

Inclusion of local stakeholders

What importance does the local stakeholder knowledge have for the outcome?

Integration of knowledge

Are the combined resources of participating actors contributed independently to the final outcome, or are they also contributed jointly between participating actors?

Outcome
Is the outcome generalisable, or is it specific to a particular area or target group?

PRESENTATION TEMPLATE

The final report presentation template separated basic information from the qualitative analysis and descriptions of the process.

It must be noted regarding the organisational mapping of each process that in some cases the representation of a certain organisation or stakeholder group might be limited to one or only a few individuals. The relevance of including them or not was not based on the quantitative representation or amount of contribution, but rather on whether the particular knowledge and experience emanating from that organisation or stakeholder group was deemed valuable to the process and thus included into co-creation.

Basic information:

Type
Keywords
Location
Engaged partners and stakeholder groups
Funding
Duration
SDGs

Further description (only for selected processes):

Challenges
Good practices & solutions
Outcomes & opportunities
Lessons learned & recommendations

Full presentations of the identified processes appear in Part II.

ETHICAL CONSIDERATIONS

All interviewees were informed about the writing of this report and were presented with the text describing their particular inclusion in the final draft to be able to comment on the description of the process, mainly for corrections of basic facts and quotes. The interviewees were asked whether they consented to be included with full names in the list of sources. If consent was not given, their names were erased from the report.

Furthermore, the relative proximity of the investigation to the interviewees was taken into account when analysing and reviewing the results. Some of these were colleagues of the author, members of the SNODE steering group, or in other ways part of collaborations and organisations with which the SNODE and/or Openlab have interacted. In order to secure empirical and analytical stringency, considerable attention has been paid to reporting draft reviews from individuals without this proximity whenever possible.

LIMITING THE SCOPE

It has been a firm assessment during the investigation that co-creation cannot be completely boiled down to unyielding pre-disposed concepts. It is a flexible process in constant development and must be treated as such. While the triple and quadruple helix models are valuable watermarks for how to deem a co-creation process particularly interesting, it must nevertheless be made clear that they are models representing reality, not reality. Therefore, when mapping processes, priority was given to processes in which triple or quadruple helix forms of co-creation could be observed, but other processes involving users in creating sustainable solutions were included as well, even if they would only consist of two observable sectors or interest groups.

AN OVERVIEW OF THE STOCKHOLM REGION

The Stockholm Region has been chosen due to the SNODE being located in and focussed on the development of this region. It is to be understood as including everything within the administrative area of the county of Stockholm.

Stockholm County covers 6 519 square kilometres and has a population of around 2.3 million.[95] It encompasses 26 municipalities of which the City of Stockholm has the largest population (around 960 000[96]). The largest municipality in terms of size is by far Norrtälje (2 011 square kilometres, i.e. nearly a third of the total area). It is important to distinguish between the *Stockholm Region* (Stockholm County or Greater Stockholm) and the *City of Stockholm* (municipal Stockholm).

[95] SCB. Befolkningen i Stockholms län 2016.

[96] SCB. Befolkningen i Stockholms län 2016.

Figure 5. An overview of the Stockholm Region and the City of Stockholm.

SOCIETAL SECTORS (AS DELIMITED WITHIN THE MAPPING PROCESS)

Public sector

The public sector consists of governing institutions such as municipalities and publicly steered authorities and agencies, as well as individual or groups of public employees.

Private sector

The private sector consists of privately managed businesses, whether large (>249 employees), medium-sized (50–249 employees), small (SEs, 10–49 employees), micro

(<10 employees or maximum 2 000 000 € turnover), or individual entrepreneurs.[97] Although quite different in many regards, the common denominator is the main incentive of commercial gains and non-democratic governing structures. This also includes the financial sector such as banks and stock exchange actors.

Academia

Academia consists of universities and other institutes and centres for higher education and/or research, as well as individual researchers or research collectives. The three incentives of academia are providing higher education, conducting research, and applying knowledge to society (often referred to as *the third objective*). In this context, actors do not need to meet all of these incentives in order to be classified as academic.

Civil society

The civic sector or civil society includes a variety of activities and organisations. Three main understandings of civil organisations can be found in contemporary research: the *non-profit*, *mutual*, and *movement* approaches, respectively. The non-profit approach stresses local or national collective associations based on common interests such as sports, religion, or cultural activities. The mutual approach stresses self-help groups and co-operatives for enhancing mutual benefits. The movement approach, finally, stresses the NGO, trade union, and lobby organisation spectrum.[98] Actors in each of these corners of civil society share an internal democratic governing system, usually based on membership voting. In this investigation, citizens and residents are also included in this sector, whether organised or not.

Hybrids and other categories

Some organisations do not fit the standards of any of the four above-mentioned categories. For example, publicly owned companies work to gain profit but are simultaneously steered by politically appointed representatives depending on the governing body, such as Stockholmshem (public housing company in the City of Stockholm). Another example is privately owned research institutes with the aim of providing applied research aimed at a particular industrial or societal branch, such as medicine. Moreover, co-operatives for economic purposes, such as housing associations (Swedish: "*bostadsrättsförening*" or "BRF"), function partly as civil democratic organisations and partly as private companies. Inter-Governmental Organisations (IGOs) also comprise their own particular category.

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[97] The European Commission: "What is an SME?" http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition_sv Accessed 26 February 2019.

[98] Wijkström, Filip. 2004. "The Role of Civil Society: The Case of Sweden in International Comparison". *Paper prepared for and presented at The 1st International Korean Studies Workshop on "Civil Society & Consolidating Democracy in Comparative Perspective."*. Yonsei University. 14-15.

Results

This section is divided into five parts. The first part presents the processes; fundamental information about their duration, location, and funding condition; and a summary of the answers from respondents regarding the co-creation process. Then follows the analysis section, in which the operationalised questions described in the Methods section are answered. The third part presents four models or ideal types based on the structuring of co-creation observed in the processes. Fourth, the methodologies and frameworks used or developed by the studied processes are presented with critical remarks. Finally, a discussion of the results concludes the report's findings.

SELECTED PROCESSES

The mapping process identified over 150 different processes and conducted 53 interviews, including members of the steering group of SNODE and individuals from processes later assessed as not being relevant for selection for analysis.

These 26 processes were identified as meeting the mapping criteria and therefore were investigated and analysed according to the methodological framework.

1. **Bagarmossen**

Citizen-driven local development process.

2. **C/O City**

R&D project for improving tools of assessing ecosystems services in urban environments.

3. **DataSmart**

Product development project for increasing digital accessibility for cognitive functional variations.

4. **Decode**

Research project for designing participatory processes in urban development. National platform for applied research.

5. **Digital Demo Stockholm**

Innovation partnership platform and think-tank hosting demo projects.

6. **Divercity**

Process and policy development project for joint building ventures.

7. Elastiska Hem

Innovation and research project exploring diverse forms of shared living and shared economy in local housing areas.

8. ElectriCITY

Open innovation platform and economic association.

9. Enable

Research project. Local branch of the EU project “Enable: Enabling Green and Blue Infrastructure Potential in Complex Social-Ecological Regions”.

10. eRoad Arlanda

Innovation project for testing electrified roads.

11. Fyrklövern

Local urban development process in Upplands Väsby.

12. Grow Smarter

EU Horizon 2020 *Smart Cities and Communities* project. Local testbed and housing restoration project.

13. Gröna Solberga

EU-funded testbed in local area for sustainable housing.

14. Hållbara Lekmiljöer

Testbed project for transforming urban playgrounds into digitalised, sustainable, user-friendly green play environments.

15. LEADER Stockholmsbygd

EU regional development project and non-profit organisation for rural and peri-urban development.

16. LIFE IP Rich Waters

Collaborative projects for restoration and development of lake Mälaren.

17. Matlust

EU regional development project for sustainable food production.

18. Mo-bo

Living lab, testbed, research and design project concerning architecture for sustainable mobility.

19. Norra Djurgårdsstaden (Royal Seaport)

Hallmark sustainable urban development project with R&D sub-projects.

20. Odlande Stadsbasarer

Business innovation and sustainable food production development project.

21. Rinkeby

Urban development process and co-operative social enterprise of catering and food services.

22. Rosendals Trädgård (2000 kvm)

Sustainable food production Vinnova-funded project phase 1.

23. Smart Kreativ Stad

EU regional development project for film in sustainable urban development.

24. Södertörnsmodellen

Sustainable urban development policy project and knowledge platform.

25. #UrbanGirlsMovement

Participatory public space development project and policy dialogue for feminist urban planning.

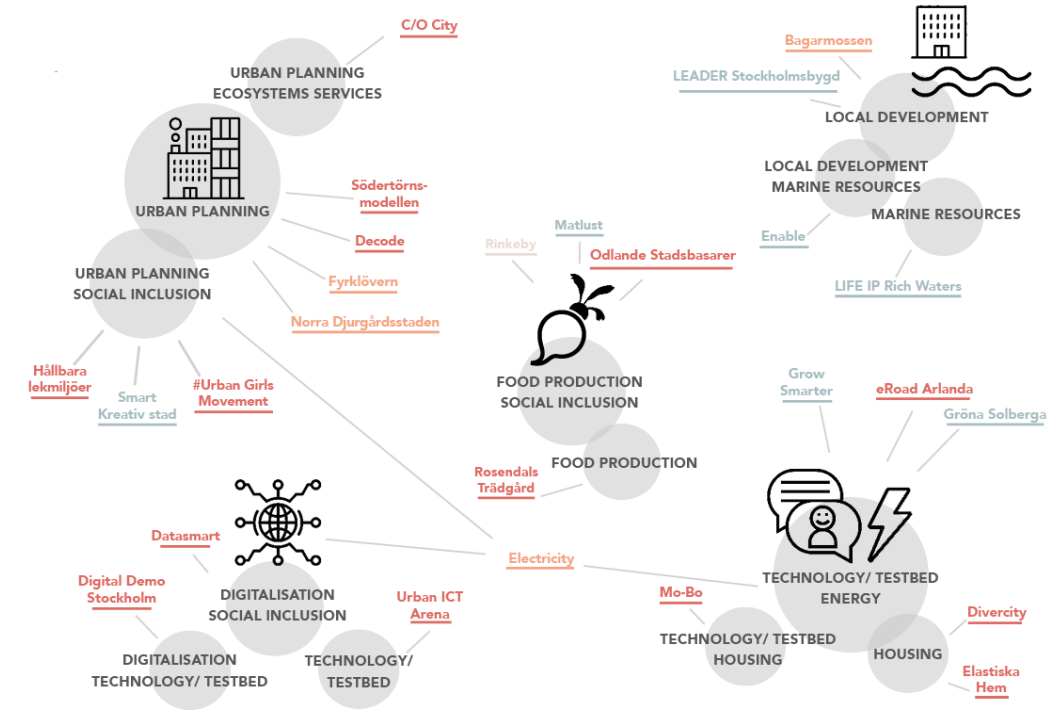
26. Urban ICT Arena

Platform and open testbed for ICT exploration and development.

Mapping

The selected processes from the mapping are presented below according to two parameters, focussed sustainability issues and funders. Colours indicate the main funders.[99] For detailed information about the 26 selected processes, see the Appendix.

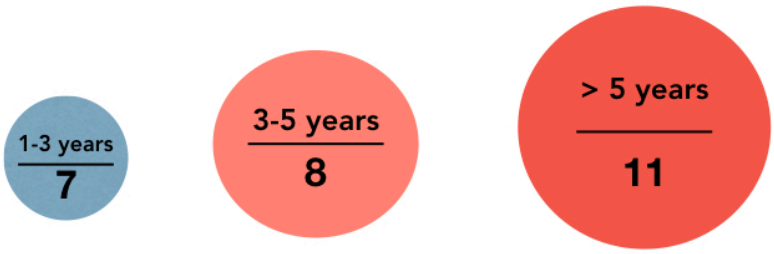
Figure 6. Mapping of selected processes.



RED: Vinnova
BLUE: EU
GREY: Tillväxtverket
ORANGE: Other

[99] The project Smart Kreativ Stad has received funding from both EU and Tillväxtverket but is here listed as blue, i.e. EU. Bagarmossen is funded by Stockholmshem, Fyrklövern is funded by Upplands Väsby Municipality, Norra Djurgårdsstaden is funded by the City of Stockholm, and ElectriCITY is funded by all participating members because it is an economic association.

Figure 7. Duration of selected processes.



A total of 18 processes work under strict time limitations whereas the 8 others, although largely project funded, have more stable foundations. Out of these two groups, 11 processes have been going on for 5 years or longer, often including a less structured but essential start-up, problem formulating, or pre-study process.

Figure 8. Main funders of selected processes.

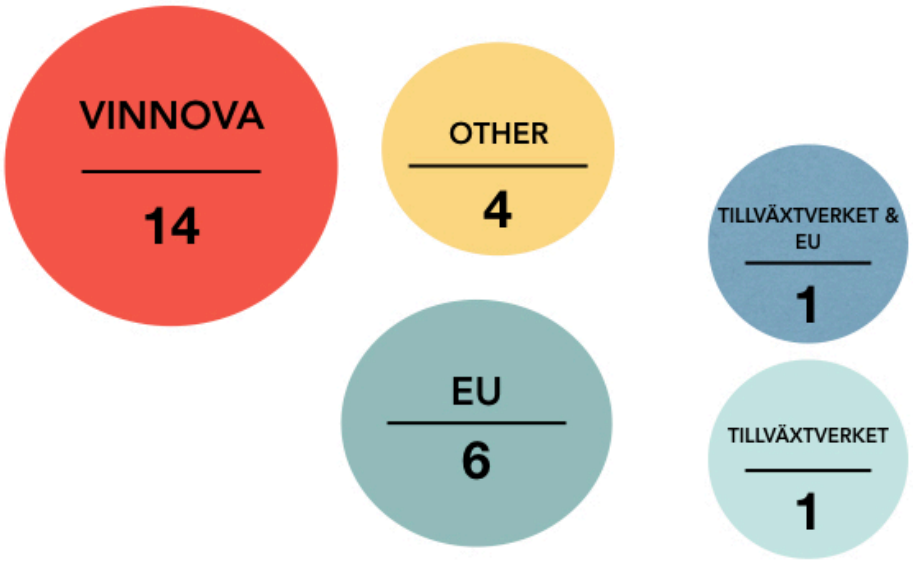
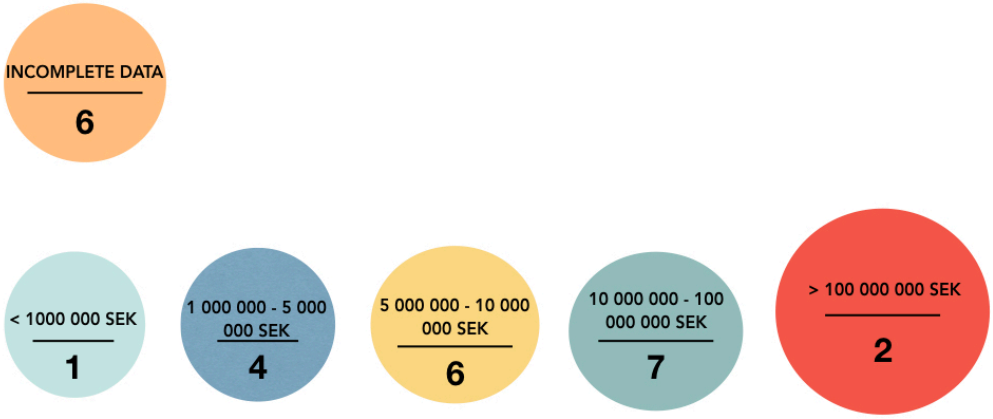


Figure 9. Amounts of funding of selected processes.



Funding ranges from less than a million SEK (Rosendals Trädgård, Vinnova) to hundreds of millions. The four highest-funded processes are (partner funding excepted):

Grow Smarter (EU; roughly €250 000 000).

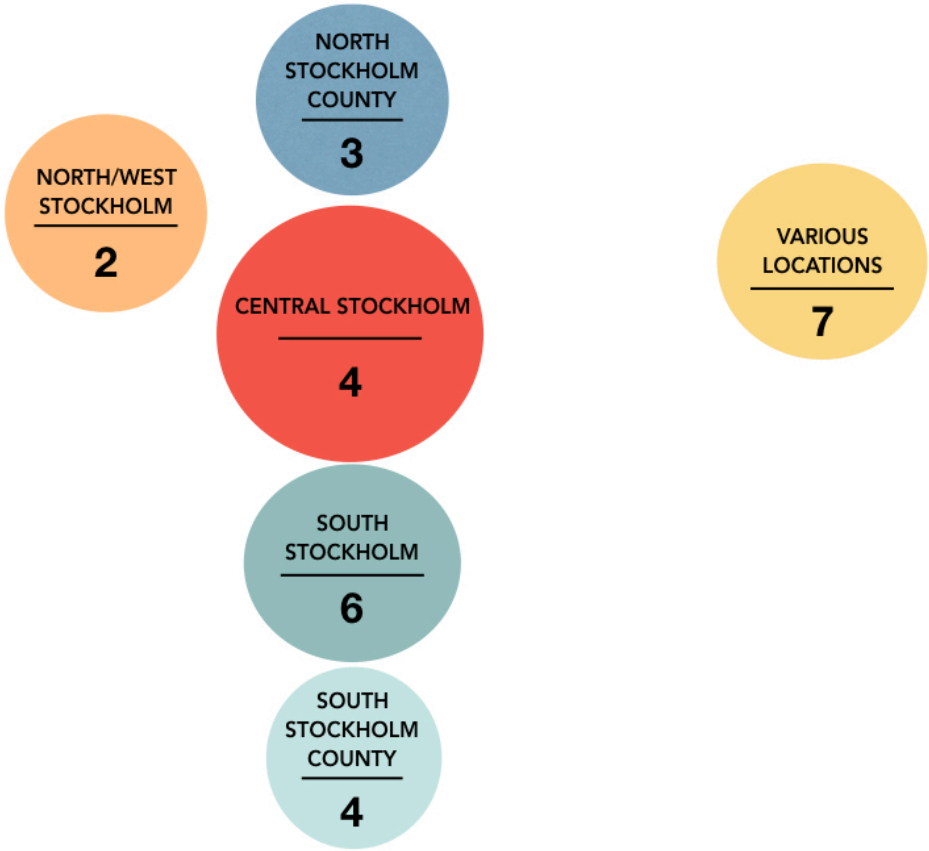
LIFE IP Rich Waters (EU; €9 736 678).

eRoad Arlanda (Vinnova and others; roughly 80 000 000 SEK).

LEADER Stockholmsbygd (EU; 46 000 000 SEK).

These numbers do not take into account the additional co-funding of involved project partners. For more detailed descriptions, see Part II.

Figure 10. Locations of selected processes.



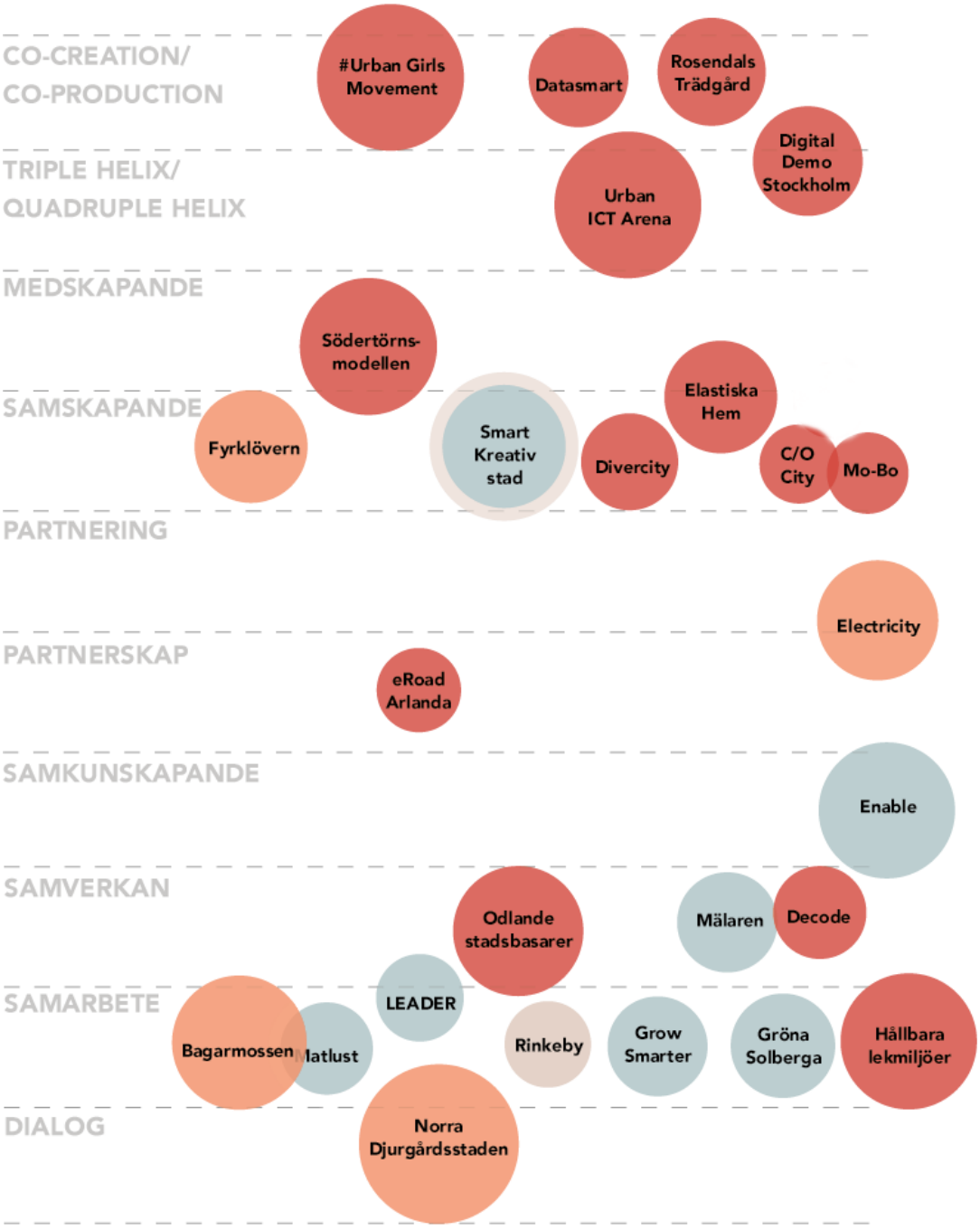
A large portion of the processes take place within the City of Stockholm, with an equal distribution of processes in the north and south of the city. However, many processes operate in various locations, for example Decode, which conducts research both in and outside the region, and DataSmart, which focuses on a target group rather than a particular area. It should therefore be reasonable to claim that the processes are fairly equally distributed over the region. However, none of the selected processes were observed in nor involving the municipalities of Ekerö, Danderyd, Lidingö, Upplands-Bro, or Vallentuna.

SUMMARY OF RESPONDENT ANSWERS

This section presents and condenses the answers to the semi-structured interviews derived from the research questions as described in the Methods section.

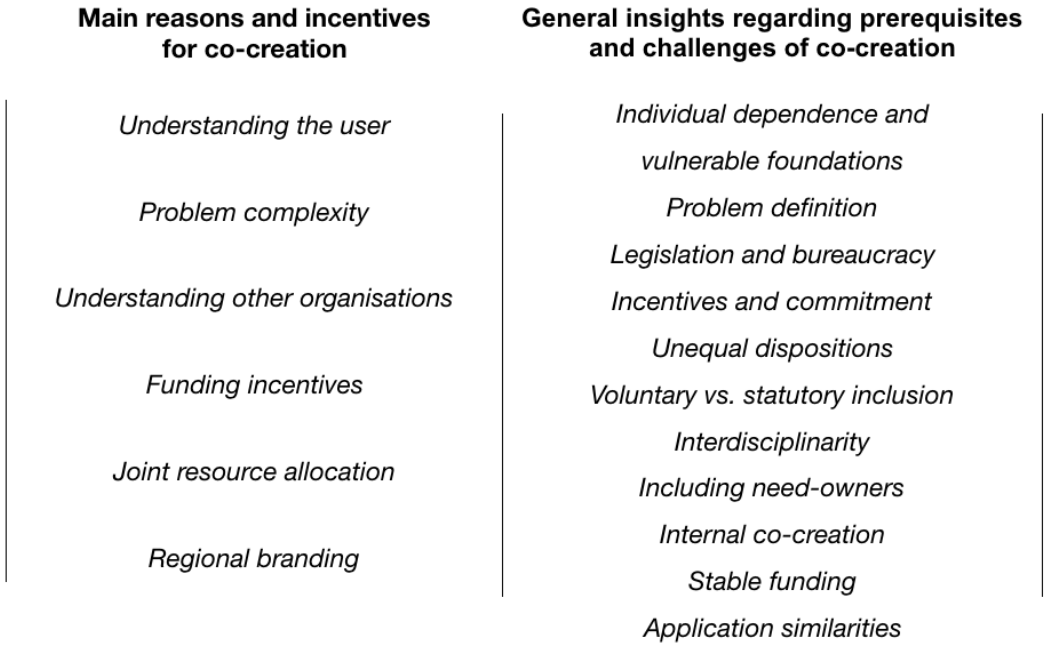
RESPONDENTS' VIEW ON CO-CREATION AND ASSESSMENT OF ITS PREREQUISITES

Figure 11. Concepts and synonyms of co-creation used by selected processes.



The figure above presents the main choices of concepts and synonyms used by respondents regarding co-creation (*medskapande, samskapande, samkunskapande*), including various Swedish concepts denoting collaboration (*samarbete*), joint effort (*samverkan*), dialogue (*dialog*), and partnership (*partnerskap*). As with the mapping figure above, the processes are coloured according to funders: Vinnova (red), EU (blue), Tillväxtverket (grey), and other (orange). Note that the respondents might well have been aware of other concepts than those presented above and might also have used several of them; however, the interviews showed these concepts to be the most prominently used concepts.

Figure 12. Summary of reasons, incentives, insights regarding co-creation of selected processes.



Main reasons and incentives for co-creation displayed by processes

These answers refer to the most fundamental level of understanding of co-creation as a concept and practice. Respondents were asked to provide their view on co-creation and why they believed it to be necessary.

Understanding the user:

Understanding the user or need-owner, which is considered a vital prerequisite for solving complex problems, requires a co-creation process.

Local residents have essential knowledge that should be included in planning and developing urban environments.[100]

[100] Södertörnsmodellen workshop at Stockholm Urban Forum. 2019.

Problem complexity:
The issue at hand requires diverse expertise and innovation, and business as usual is inadequate to solve the challenges related to Agenda 2030. “Silos” in organisations, standard procedures, and basic research are harmful to innovation and urban development.

Understanding other organisations:
All actors will gain from the process something that is otherwise not obtainable. For example, the understanding of other organisations is a valuable outcome in itself.[101]

Funding incentives:
Funding agencies state the requirements of some degree of cross-sectorial collaboration to those who are granted funds.[102]

Joint resource allocation:
Actors lack sufficient financial and material resources on their own, and they form partnerships to enhance their capabilities, for example, in product or business development, which might evolve into co-creation.

Regional branding:
Regional and local competition and branding is boosted by innovative development, thus encouraging co-creation projects.

General insights regarding prerequisites and challenges of co-creation
These answers refer to respondents’ critical assessment of their own process. Respondents were asked to provide examples of what might affect the process in negative and/or positive terms.

Individual dependence and vulnerable foundations:
Innovation projects work under precarious circumstances; if the project fails, the whole innovation idea might lose credibility, thus affecting many societal development processes in severe ways.[103] Individual dependence is generally strong in these types of processes, and having the right people rather than organisations or resources is essential.

Problem definition:
It takes substantial amounts of time to formulate a joint understanding, vision, and problem definition, usually a year or more. This is also true of transformative processes in general. If key stakeholders are not included in vision formulation early, they are unlikely to be cooperative later on because they have process objectives worked out on their own

[101] Interview with Karin Kjellson, Divercity. 2018.

[102] Interview with Zahra Kalantari, Stockholm University. 2018.

[103] Interview with Hans Säll, eRoad Arlanda. 2018.

beforehand. Including citizens in planning can be a means for gaining acceptance and consensus in decisions, thus supporting the procedure through the integration of valuable local knowledge.

Legislation and bureaucracy:
Bureaucracy and innovation procurement legislation tend to obstruct the process.[104]

Incentives and commitment:
Co-creation does not guarantee commitment. Researchers are encouraged to co-create and collaborate with society – the so called "third objective" of academia – but in practice they often lack the resources required for this.[105] Generally, municipalities lack structures for developmental work whereas private organisations do not.[106] Norms and standards for partnership structures are essential in order for them to work, but they have only recently been developed.[107]

Unequal dispositions:
Broad networks are significantly valuable, and those lacking networks beforehand might therefore be unable to conduct co-creation.

Although private companies may provide essential capacity for co-creation, they also pose the risk of claiming exclusive rights to solutions and communication strategies, which is incompatible with jointly developed processes.[108]

If researchers are coordinating and driving the process, they risk overrunning other actors in the process with their own perspective if they do not focus on conducting co-creation. If actors who are more accustomed to cross-sectorial work (e.g. architects and consultants) run the process, this risk is lowered.[109]

Collaborative processes usually include certain actors gaining more attention through their stronger voices.[110] These actors might not represent the whole complexity of the stakeholder constellation, which risks ceding interpretation prerogatives to more narrow interests.

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[104] Interview with Johan Schuber, Digital Demo Stockholm. 2018.

[105] Interview with Elina Eriksson, Mo-Bo. 2018.

[106] Interview with Lise-Lott Larsson Kolessar, Södertörnsmodellen. 2018.

[107] Interview with Hans Säll, eRoad Arlanda. 2018.

[108] Interview with Richard Dahlstrand, ElectriCITY. 2018.

[109] Interview with Elina Eriksson, Mo-Bo. 2019.

[110] Södertörnsmodellen workshop at Stockholm Urban Forum. 2019.

Voluntary vs. statutory inclusion:
Individuals from different sectors must commit willingly to co-creating with others, much unlike today's system of statutory inclusion, such as participatory dialogue. Currently, co-creation and participatory processes mainly attract highly educated, committed people or highly dissatisfied, negative people.[111]

Interdisciplinarity:
Fostering interdisciplinary teamwork is considered essential but likewise interesting and stimulating, although it is also recognised to be challenging.

Including need-owners:
Without including the users or local actors who are directly affected by the given problem, the process will not succeed.

Internal co-creation:
Practicing co-creation in the process also requires internal co-creation. The process needs to be structured in a way that the organisers or coordinators work accordingly amongst themselves, for example, when preparing the funding application.[112]

Stable funding:
Having access to substantial funding from an early stage enables one to gather more stakeholders because it provides credibility.[113] Moreover, reflecting upon the scalability of the approach of the process might contribute to long-term funding. Processes granted third-stage funding in Vinnova programmes generally work towards policy development or on a systems level.[114]

Application similarities
There are usually several applications for the same funding programme that resemble each other too much for all of them to be considered relevant for the programme.

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[111] Interview with Petra Dalunde, Urban ICT Arena. 2018.

[112] Interview with Elin Andersdotter Fabre, #UrbanGirlsMovement. 2018.

[113] Interview with Lisa Enarsson, Grow Smarter. 2018.

[114] Interview with Björn Hellström, Decode. 2018.

Practical recommendations and guidelines for co-creation displayed in processes

Most respondents shared a number of general guidelines for their processes. These are presented before moving on to more concrete methods or strategies.

- Maintaining an open, sharing environment.
- Embracing gut feeling, intuition, and instinct.
- Maintaining proximity to the problem and avoiding becoming a satellite project.
- Learning by doing and experiencing practical situations as a team.[115]
- Conducting workshops with all or most stakeholder groups.
- Fostering participant commitment by having each stakeholder assigning resources for the process.
- Harness necessary knowledge where it can be found; for example, civil society organisations know how to mobilise voluntary local resources.[116]
- Employing conventional project management with clear roles.
- Adhering to regulations, contracts, and formalities regarding collaborative structures.
- Having a clear leadership structure and clear decision-making processes.
- Anchoring within respective organisations.
- Aligning interests between participants.
- Sharing vision and framework.
- When working with local citizens and residents, commitment and interest can be kindled by offering a variety of activities related to the co-creation process.[117]
- Making conscious decisions when choosing stakeholders and participants.[118]
- Giving priority to participants with greater expertise.

[115] Interview with Eva-Lotta Sallnäs Pysander, Hållbara Lekmiljöer. 2018.

[116] Gröna Solberga workshop at Stockholm Urban Forum. 2019.

[117] Gröna Solberga workshop at Stockholm Urban Forum. 2019.

[118] Interview with Åsa Kallstenius, Elastiska Hem. 2019.

Figure 13. Methods, strategies, opportunities, methodologies, and frameworks for co-creation utilised or developed by processes.

Methods, strategies and opportunities for co-creation	Methodologies and frameworks utilised or developed by processes
Equality between sectors and knowledges	*Citizen research*
Early dialogue	*Design Science*
Use present expertise efficiently	*Design Thinking*
Thematic focus	*GAIT Systems Change in Open Networks*
Decentralisation and neutralisation	*LEADER*
Transparency	*Mission-driven innovation*
Democratic process	*Not Boring*
Adaptation to stakeholders' dispositions	*Transition Management*
Ambition flexibility	
Non-conventionality	
Inclusion coherence	

Methods, strategies and opportunities for co-creation
These answers refer to the manner in which processes carried out co-creation on a practical level. Respondents were asked to provide examples of practical and strategic responses to and opportunities for managing the challenges of supporting the co-creation process.

Equality between sectors and knowledges:
Multi-sectorial expert groups are vital to the process. One actor or form of knowledge must not be elevated above the others in the process as a whole, although they will likely have greater expertise in some regards.

Early dialogue:
Including stakeholders and project members before funding has been granted, perhaps in co-writing application documents or other forms of joint problem formulation, might be a very productive and long-term cost-saving measure. Regular physical meetings should be planned ahead of time to keep up a steady dialogue.[119] Clarity of expectations and requirements needs to be established in the early stages of a process.

Use present expertise efficiently:
Having a complete, shared advanced expertise from the beginning is likely to be impossible, but if most participants possess a shared understanding about how to professionally conduct the process, this can enhance the outcome substantially.[120]

Thematic focus:
Focussing heavily on core needs and issues should be prioritised over remaining in peripheral debates in order to gather stakeholder knowledge and maintain direction and focus. Otherwise, processes might be overwhelmed by internal discussion.

Decentralisation and neutralisation:
It is appreciated to vary meeting locations because stakeholders are often located far apart thus so as not to favour anyone over others. There is also a need for neutral spaces in which all stakeholders can assemble and no single actor has the interpretative prerogative. Maintaining multiple sessions and processes simultaneously in order to meet everyone's specific demands (e.g. office hours or evenings) might be highly relevant.[121] It is also important to use individual enquiries so as not to risk group consensus.[122] Local actors should also produce and present their knowledge on their own terms, possibly with tools

[119] Interview with Elin Andersdotter Fabre, #UrbanGirlsMovement. 2018.

[120] Interview with Anna Emmelin, Rosendals Trädgård. 2019.

[121] Interview with Erik Andersson, Enable. 2018.

[122] Interview with Erik Andersson, Enable. 2018.

provided by the coordinators of the process. For example, Hållbara Lekmiljöer provided children with cameras to record their daily lives.[123]

Transparency:
It is important to preserve results and empirical data, in both digital and analogue formats, and to encourage and practice transparency of process results and data regularly.[124]

Democratic process:
It is beneficial to include user groups wherever possible where they provide knowledge useful to the process; however, if they for various reasons are difficult to include they should only be given decision-making power when feasible.[125] Consultants should not be the ones driving the process, rather the project owners or need-owners must decide how the process should unfold. Evaluation, voting on, or discussing certain process phases or future decisions should be conducted in writing rather than verbally, thus allowing more individuals to participate more equally.[126]

Adaptation to stakeholders' dispositions:
Process managers must step into the mind-set of stakeholders and their particular interests, whether material or immaterial, and should utilise multiple methods and/or develop methods over time according to the needs of participating stakeholders. Coordinating and connecting stakeholder groups and individuals unaware of one another is also necessary according to both Bagarmossen and LEADER.[127]

Ambition flexibility:
Depending on the combined knowledge within the multi-stakeholder group, ambitions need to be adjusted so that everyone involved can comprehend the methods and concepts that are used.

Non-conventionality:
Researchers and practitioners alike are required to challenge some of their disciplinary traditions and are encouraged to break out from ordinary discussions and meetings and to work in new ways, both visually and with different materials.[128] It is also considered

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[123] Interview with Eva-Lotta Sallnäs Pysander, Hållbara Lekmiljöer. 2018.

[124] Interview with Elin Andersdotter Fabre, #UrbanGirlsMovement. 2018.

[125] Interview with Stefan Johansson, DataSmart. 2018.

[126] Interview with Alarik von Hofsten, Fyrklövern. 2018.

[127] Interview with Tobias Lind, Bagarmossen Smartup. 2018; interview with Susanne Ortmanns, LEADER Stockholmsbygd. 2018.

[128] Interview with Sara Araya, Digital Demo Stockholm. 2018.

beneficial to step out of the observer's role and into participation and experience, regardless of one's affiliation.[129]

Inclusion coherence:
When including users in problem formulation and decision-making, they need to be included in follow-up processes as well so as not to diminish their trust.[130]

Methodologies and frameworks utilised or developed by processes
Citizen research: Enable.
Design Science: GCity (Urban ICT Arena).
Design Thinking: Digital Demo Stockholm, Elastiska Hem (partially).
GAIT Systems Change in Open Networks: Rosendals Trädgård.
LEADER: Leader Stockholmsbygd.
Mission-driven innovation: ElectriCITY.
Not Boring: Urban ICT Arena.
Transition Management: Mo-Bo.

[129] Interview with Petra Dalunde, Urban ICT Arena.

[130] Interview with Lise-Lott Larsson Kolessar, Södertörnsmodellen. 2018.

Analysis

Note that this assessment only refers to the co-creation aspect of the process and will not imply whether the main social-ecological objectives have been reached. Moreover, designing the process for enabling co-creation does not mean that co-creation has been achieved (although it will certainly enhance the possibilities for this), nor does the lack of coherent methods for co-creation guarantee a "flawed" co-creation process. This assessment focuses primarily on diversities and commonalities among the studied processes in order to draw notable conclusions about the current state of the field of sustainable co-creation. It should thus not be regarded as a grading procedure.

LEVEL OF INVOLVEMENT

As stated in the Methods section, the investigation distinguishes between a low level of involvement (informing), a middle level (consulting), and high level (co-producing).

Civil-academia-public-private (quadruple helix)
DataSmart
Divercity
Elastiska Hem
ElectriCITY
Enable
Fyrklövern
Hållbara Lekmiljöer
Matlust
Odlande Stadsbasarer
Smart Kreativ Stad
Södertörnsmodellen
#UrbanGirlsMovement
Urban ICT Arena

A total of 13 processes are categorised as quadruple helix co-creation in which actors from all four sectors contribute on a co-producing (i.e. high) level. This means that they all have included citizens or civil society actors on a high level. Furthermore, all except Elastiska Hem, Smart Kreativ Stad, and Divercity have included unorganised citizens on a high level.

Civil-academia-private
Rosendals Trädgård

This process works without public actors being highly active. Rosendals Trädgård engages with the publicly owned companies Stockholmshem and Liljevalchs, but not with the local public administration.

Civil-public-private
Bagarmossen
LEADER
Rinkeby

Bagarmossen and LEADER have included researchers, but they appear to have contributed less in terms of integrating knowledge and have rather studied the process from an outside perspective. LEADER has been evaluated by KTH and SLU, respectively, and Bagarmossen was studied by researchers from Smart Retro Demos Helsinki and KTH.

Public-private-academia (triple helix)
C/O City
Decode
Digital Demo Stockholm
eRoad Arlanda
Gröna Solberga
LIFE IP Rich Waters
Mo-Bo
NDS

These nine processes have, to various extents, included researchers as well as practitioners in designing and integrating solutions, but without citizens or civil organisations having a high level of intensity of involvement, or – as is the case with LIFE IP Rich Waters, Mo-Bo, eRoad Arlanda, and C/O City – not being present at all.

Public-private
Grow Smarter

Although including four sectors in the process, the civil and academic participants in Grow Smarter are deemed as reaching only a consulting level.

COMPLEXITY AWARENESS AND METHODOLOGY

Based on the answers summarised previously, all 26 processes display critical awareness of the necessity for and requirements of co-creation and display an ambition to co-create with or without a specific strategy. Furthermore, all 26 processes display some assessment of various factors affecting the co-creation process. Fewer than half (11) employ methods and

strategies (pre-designed or explorative) particularly for the sake of supporting the co-creation process.

Note that this analysis exclusively states the presence of methodologies for enabling and supporting the co-creation process itself. This does not imply that the other 16 processes have not used a methodology or strategy at all. In fact, many have developed or used methodologies for the purpose of reaching objectives related to their field of research or practice; for example, projects within Urban ICT use the *Not Boring* methodology or *Design Science* for enabling innovation practice. Others use overarching frameworks that might foster their co-creation effort. ElectriCITY applies a *mission-driven innovation* approach, and Mo-Bo uses *Transition Management* as a theoretical framework for developing their operations. Distinguishing between whether these methodologies and frameworks can be considered co-creation methodologies or not has ultimately come down to the research and operationalising questions of whether these approaches contribute to integrating knowledge and including different stakeholders in the process. A methodology or framework stating that you should co-create with different stakeholders is thus not considered a co-creation methodology.

AWARENESS OF CO-CREATION (LOW LEVEL)

All selected processes display an awareness of the necessity for and implications of co-creation. While not necessarily using a coherent term for co-creation, they propose a collaborative form of working in which different sources of knowledge are utilised to form a larger whole in order to realise the specific social-ecological goals of the process. However, this first level does not include a fully conscious and critical assessment regarding if and/or how co-creation should be achieved and what factors might affect the process and why, nor do they design a certain procedure, strategy, or methodology with which to manage these factors.

AWARENESS AND CRITICAL ASSESSMENT OF CO-CREATION (MIDDLE LEVEL)

Bagarmossen
C/O City
ElectriCITY
e-Road Arlanda
Grow Smarter
Gröna Solberga
LIFE IP Rich Waters
Matlust
Mo-Bo
Norra Djurgårdsstaden
Odlande Stadsbasarer
Rinkeby
Smart Kreativ Stad
Södertörnsmodellen
Urban ICT Arena

A slight majority of the processes, 15, reach the middle level, in which the necessity for jointly created solutions and knowledge is acknowledged, as well as a fundamental or elaborated definition of beneficial and aggravating factors for achieving a successful co-creation process. These processes do, however, lack a specific strategy or method for supporting the co-creation process. They display expert knowledge regarding the issues that they aim to solve or mitigate. Having the right expertise present is a prerequisite, but the difficulties of coordinating and harnessing this expertise are also frequently mentioned. However, when asked about coherent means and strategies for overcoming these difficulties, answers were less concrete or indicated that no such elements have existed within the process.

AWARENESS, CRITICAL ASSESSMENT, AND STRUCTURING OF CO-CREATION (HIGH LEVEL)

DataSmart
Decode
Digital Demo Stockholm
Divercity
Elastiska Hem
Enable
Fyrklövern
Hållbara Lekmiljöer
LEADER Stockholmsbygd
Rosendals Trädgård
#UrbanGirlsMovement

A total of 11 processes meet the requirements of the first two levels, but also – as part of their strategy for reaching their main objectives – apply, design, or experiment with methodologies for supporting the co-creation process itself. Five of these 11 processes correspond to the 13 identified high-level involvement quadruple helix processes presented above.[131]

The aspects or phases of the co-creation process that are emphasized differ among the processes. Some focus on mitigating power imbalances between stakeholder groups, for example #UrbanGirlsMovement and DataSmart. Others focus on harnessing the most diverse possible range of expertise, such as Elastiska Hem, Divercity, and Decode. They all share, to some extent, the challenges of including different actors in the same process. This section further discusses how all relevant processes have approached the fundamental co-creation challenges of inclusion and integration of knowledge and valuable resources.

[131] Divercity, Elastiska Hem, Enable, Fyrklövern, and #UrbanGirlsMovement.

INCLUSION OF UNORGANISED CITIZENS

Inclusion is an important aspect for all processes, but the inclusion of unorganised citizens is a particular challenge because they rarely possess the same means for participating as, for example, municipalities, companies, or researchers.

A total of 19 of 26 processes include individual citizens or groups of unorganised citizens to some extent.[132] Seven of these employ concretised strategies or methods – to varying degrees – to particularly empower these stakeholders in relation to others with more resources and capacity, namely #UrbanGirlsMovement, Decode, Hållbara Lekmiljöer, Enable, Rinkeby, Södertörnsmodellen, and DataSmart. #UrbanGirlsMovement and DataSmart have employed adapted forms of democratic processes in which their participating citizens and need-owners are enabled to impact decisions. DataSmart has used a democratic approach towards user inclusion, and their main objective has been to include their target group, people with cognitive variations, in using digital products. Thus, their process has been consciously designed to empower these key stakeholders in any way they can, such as deciding on certain features of developed products; however, empowerment cannot be granted in every aspect of the process because these stakeholders often lack the capacity and knowledge to make informed decisions. #UrbanGirlsMovement focuses on a target group (girls and young women of Botkyrka) lacking much of the power resources of other stakeholders. During the process, they have perceived a necessity for letting these key stakeholders design solutions and produce knowledge without external involvement to as great an extent as possible. Hållbara Lekmiljöer has utilised self-documentation by distributing movie cameras to local children, empowering them to tell their own stories and thus contribute to the problem formulation. Enable uses citizen research as a means for enabling local residents to contribute actively to the outcome and production of knowledge. Rinkeby is a process in which local stakeholders (unemployed women) have been empowered in a socio-economic sense through a co-operative association, while also integrating and including the knowledge and valuable resources provided by these stakeholders as essential to the process outcome. Moreover, the process organised a participatory dialogue at an early stage for problem definition. Both Decode and Södertörnsmodellen have included and integrated the knowledge of local citizens, each with the explicit ambition of establishing models for mitigating various asymmetries and differences inherent in participatory processes. In a wider sense, however, several of these processes have not utilised concrete methods for the co-creation process in a structured way. This is why some of them have not been categorised as high-level complexity awareness.

ElectriCITY and Elastiska Hem both work closely with civil stakeholders but through already organised networks and organisations with access to resources (housing associations and tenant associations, respectively). The Fyrklövern process entailed participatory dialogue at an early stage called “Väsby Labs”, in which a broad range of stakeholder groups including citizens were included, but it does not appear to have used a coherent method for empowering citizens in relation to other stakeholders, and the main

[132] Remaining processes are C/O City, Divercity, Elastiska Hem, ElectriCITY, eRoad Arlanda, Mo-Bo and LIFE IP Rich Waters.

apparent challenge was presented by the construction procedure. Norra Djurgårdsstaden has given local residents and citizens participating and consulting roles through digital and analogue means, but mainly for collaboration between different neighbourhoods.

Matlust and Odlande Stadsbasarer do not display concrete strategies or methods for inclusion of participating citizens because they mainly constitute a workforce and testers in both of the projects. Similarly, Rosendals Trädgård does not employ methods for empowering citizens – who mainly participate on a voluntary basis as product testers – but it displays awareness regarding the process of knowledge integration: "Those owning the transformative process should not have to translate their thinking into concepts used by researchers."[133] Grow Smarter has included a housing cooperative as an active part of their testbed, but seemingly without reflecting on power asymmetries. Gröna Solberga includes local residents regularly in testing solutions, but does not seek to provide means for them to partake in other ways than voluntary contributions; however, the objectives of this process have not focussed on empowerment or users co-designing solutions, but mainly on users testing solutions fabricated by private actors. In Digital Demo Stockholm, need-owners or users are assigned a similar role; however, involving them in the early stage, as in understanding their needs, makes their participatory role more thorough, albeit without empowering them in the co-creation process in relation to other actors. Divercity is organised by a civil organisation of co-operative building and housing associations and employs concrete general methodologies and strategies for co-creating, but does not particularly address potential power asymmetries within the process itself other than allowing participating co-operatives in on the same terms as others. Urban ICT Arena fosters a quadruple helix collaborative model with citizens as active contributors and/or testers, but citizens are not evidently empowered in any particular way in relation to other actors. Similarly, for Smart Kreativ Stad, citizens have been largely present as participants or in testing and evaluating pilot projects without a concrete empowerment strategy.

Bagarmossen and LEADER both regard local civil actors as crucial elements of their processes, but have not engaged in mitigating power asymmetries in any particular way other than providing general support and coordination of different actors.

OTHER REFLECTIONS

Although large-scale impacts might be the rule for co-creation processes for sustainability, few of the processes have stated explicit objectives concerning how to achieve this impact. This should not come as a surprise because the majority of processes are conducted as temporary projects. There is little space with which to focus on long-term impacts because the project-funded processes are – in some cases – a livelihood for researchers and others.

At least three of the identified main incentives for conducting co-creation correspond to pecuniary or material issues, such as requirements from funders and the economic gains in running joint processes. This aspect should not be overlooked.

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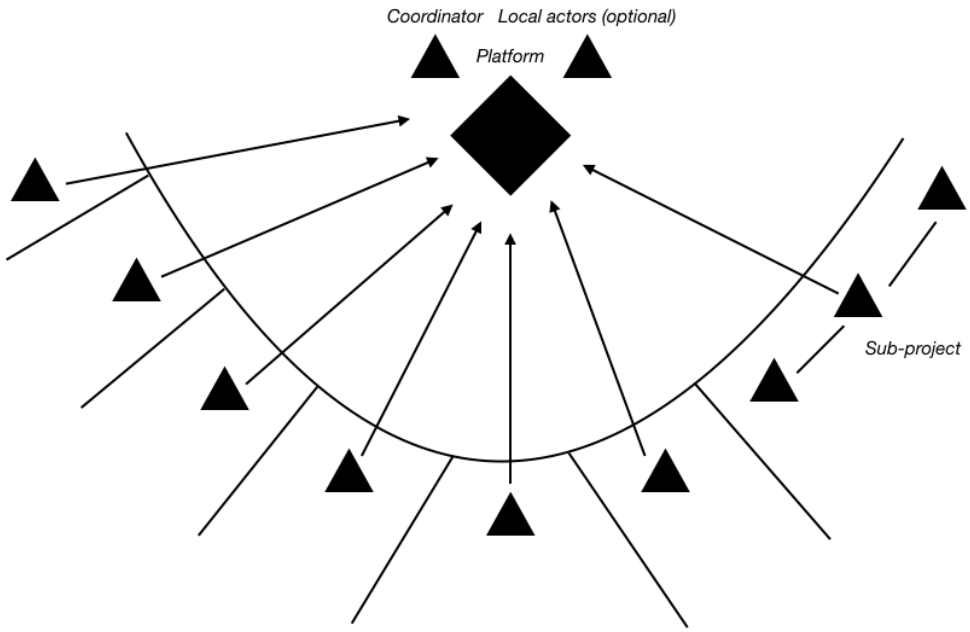
[133] "De som äger förändringsprocessen ska inte behöva översätta sitt tänkande till forskarens begrepp." Interview with Anna Emmelin, Rosendals Trädgård. 2019.

MODELS

Below are presented four models based on observed variations among processes in this report and developed through dialogue with respondents of the studied selected processes. Some of these respondents have had difficulty understanding the models, whereas other respondents have pointed out that their particular process might not be reducible to representing one particular model. Variations among and within processes might indeed lead them to represent several models, examples being Decode and Södertörnsmodellen. The models are thus supposed to be viewed as ideal types, based on the modalities of jointly created knowledge and solutions, the general or specific nature of the process outcomes, and the flexibility of the context and the involved actors. Based on these parameters, one can distinguish between the following three fundamental aspects of structuring co-creation: *independent* or *joint* contribution, *group*/*area specific* or *generalisable*, and the *essentiality* or *optionality* of local actor involvement.

The models may be further developed in analysing and describing processes such as the ones in this report. They can prove useful both to researchers and to organisers of future similar processes, for example, in the early stages of project planning, because they might contribute to reflection and reflexivity with regards to choices of action and the reasons for these choices.

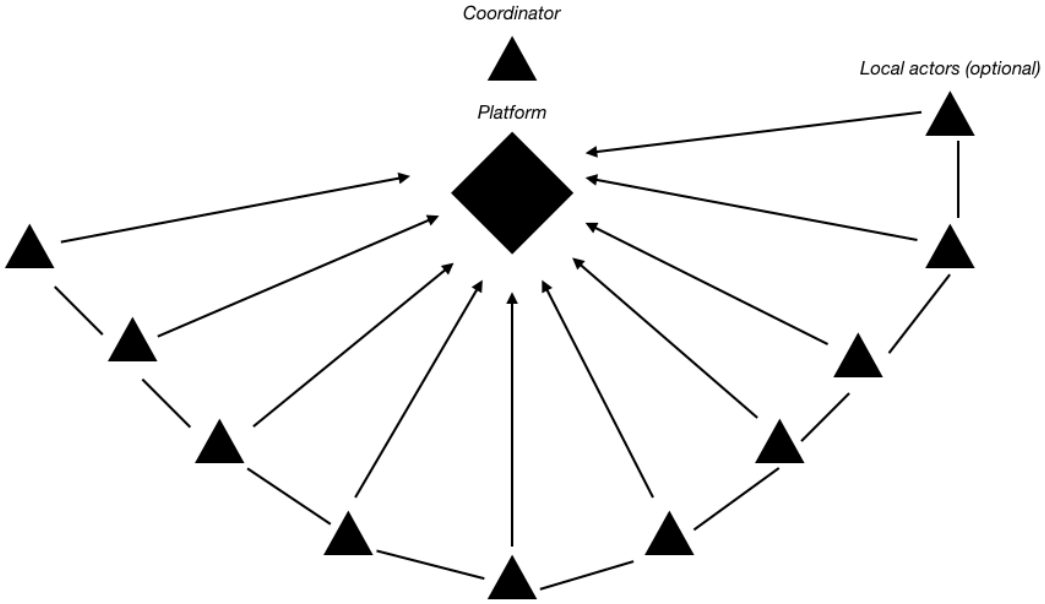
Figure 14. Model 1: Platform – independent open contribution



Model 1 refers to one or several testbeds or platforms in which a range of different actors are invited or engaged by a coordinating actor to contribute valuable resources, methodology, and knowledge to one or several test environments. The process is conducted either within the scope of a project or a more continuous platform, centre, or organisation. The outcome is generalisable and adaptable in other contexts. Citizens and local actors living or working in the environment may be an integrated part of the testing process, but this aspect is optional. They can also be replaced or complemented by other areas or contexts. Participating actors contribute their respective resources independently of each other, although some of them might co-create together within sub-projects. Thus, several independent forms of solutions and knowledge regarding the problem are generated. Model 1 is an effective way of testing multiple solutions by providing accessible testing environment, eventually integrating them into final outcomes. Eight processes correspond to this model.

Observed in:
Decode
ElectriCITY
e-Road Arlanda
Grow Smarter
Norra Djurgårdsstaden
Smart Kreativ Stad
Gröna Solberga
Urban ICT Arena

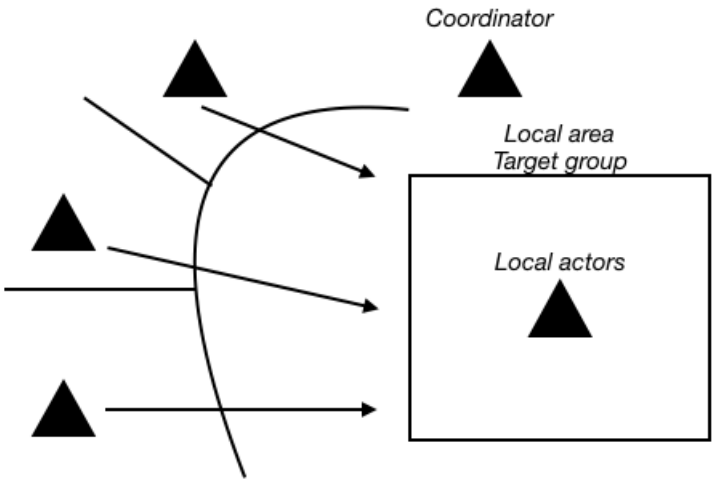
Figure 15. Model 2: Platform – joint open contribution.



Model 2 refers to one or several testbeds or platforms in which a range of different actors are invited or engaged by a coordinating actor to contribute valuable resources, methodology, and knowledge to one or several test environments. The process is conducted either within the scope of a project or a more continuous platform, centre, or organisation. The outcome is generalisable and adaptable in other contexts. Citizens and local actors living or working in the environment may be an integrated part of the testing process. They can, however, be replaced or complemented by other areas or contexts. Participating actors co-create together during all or parts of the process, although the model also allows for sub-projects. Thus, model 2 differs from model 1 in the sense that the knowledge and resources of participating actors are integrated both in the final outcome and during the foregoing process itself. Twelve processes correspond to this model.

Observed in:
C/O City
Decode
Digital Demo Stockholm
Divercity
Elastiska Hem
Hållbara lekmiljöer
Matlust
Mo-Bo
Odlande stadsbasarer
Rosendals Trädgård
Södertörnsmodellen

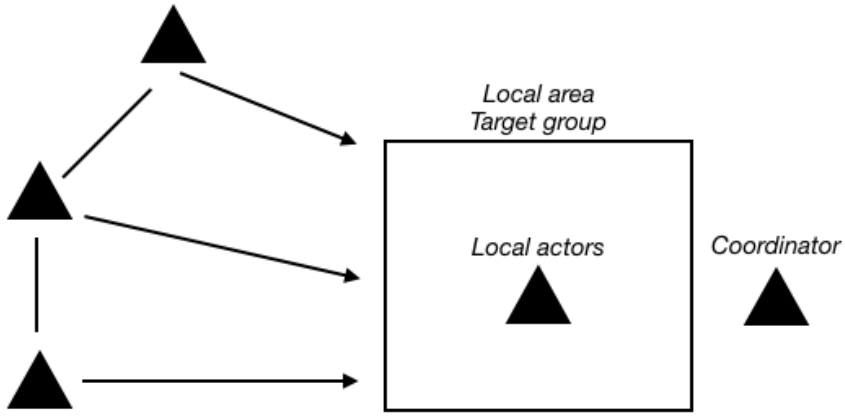
Figure 16. Model 3: Group or area specific – independent open contribution.



The process in Model 3 depends on local or user-centred knowledge. Outcomes are dependent on a specific geographical area or target group in which local knowledge is considered essential. External coordinators guide the process and may involve other external actors such as researchers and public servants or decision-makers. External and local participating actors work independently of each other in contributing to final outcomes. Outcomes are not generalisable, but the learning process might be valuable in other contexts. External actors may to various extents be replaced, whereas the target group or local area may not. Seven processes correspond to this model.

Observed in:
Decode
ElectriCITY
Enable
Fyrklövern
LIFE IP Rich Waters
Rinkeby
Södertörnsmodellen

Figure 17. Model 4: Group or area specific – joint open contribution.



Model 4 is characterised by its focus on local or user-centred knowledge. Outcomes are dependent a specific geographical area or target group in which local knowledge is considered essential. External coordinators guide the process and may involve other external actors, such as researchers and public servants or decision-makers. External and local participating actors co-create together during all or parts of the process. Outcomes are not generalisable, but the learning process may be valuable in other contexts. External actors may to various extents be replaced, whereas the target group or local area may not. Seven processes correspond to this model.

Observed in:
Bagarmossen
DataSmart
Decode
LEADER
Rinkeby
Södertörnsmodellen
Urban Girls Movement

Figure 18. Models 1–4 in relation to high-level involvement of selected processes

High-level involvement	MODEL 1	MODEL 2	MODEL 3	MODEL 4
Quadruple helix	3	6	4	3
Triple helix	4	4	2	1
Civil-public-private	-	-	1	3
Civil-academia-private	-	1	-	-
Public-private	1	-	-	-
Total	**8**	**11**	**7**	**7**

Those processes categorised as practicing quadruple helix co-creation with a high level of involvement comprise around half of the processes in each model. Those processes categorised as triple helix co-creation with a high level of involvement appear mainly in Models 1 and 2. In other words, the low or non-existing involvement of civil actors or citizens is correlated with more generalisable, large-scale ambitions. Of the civil-public-private high-level co-creation – only comprising a total of 4 observations – three appear in Model 4 and one appears in Model 3. This suggests that locally bound processes with a joint contribution structure might be less likely to involve academia on a high level.

Figure 19. Models 1–4 in relation to complexity awareness of selected processes

Complexity awareness	MODEL 1	MODEL 2	MODEL 3	MODEL 4
High-level	1	6	3	4
Middle-level	7	5	4	3
Total	**8**	**11**	**7**	**7**

Of the eight processes corresponding to Model 1, six display a middle level of complexity awareness (awareness and critical assessment of co-creation) while one corresponds to a high level (awareness, critical assessment, and structuring of co-creation). Processes operating as platforms with little or no joint contribution to outcomes thus tend to display a middle level of complexity awareness, i.e. omitting the use of strategies and methods for co-creation, although all but one of these eight have a triple or quadruple helix high-involvement level.

In Model 2, the 11 processes are divided into five middle-level and six high-level complexity awareness. In Model 3, four out of the seven processes display middle-level awareness, while the other three display high-level awareness. Reversely, in Model 4, three out of the seven processes display middle-level awareness, while the remaining four display high-level awareness.

METHODS AND FRAMEWORKS FOR CO-CREATION UTILISED OR DEVELOPED BY THE PROCESSES

This section not only presents methodologies enabling the co-creation process itself, but also introduces approaches or overarching frameworks used by some of the studied processes. Some of these approaches have not been viewed as amounting to a structuring of co-creation (as analysed above) but have nevertheless incorporated particular aspects fostering a co-creation process.

Citizen research: Enable.
Design Science: GCity (Urban ICT Arena).
Design Thinking: Digital Demo Stockholm.
GAIT Systems Change in Open Networks: Rosendals Trädgård/2000 kvm.
LEADER: Leader Stockholmsbygd.
Mission-driven innovation: ElectriCITY.
Not Boring: Urban ICT Arena.
Transition Management: Mo-Bo.

Citizen research

Citizen participation in gathering data for research projects has become a welcomed complement to otherwise limited investigations, particularly in ecological research, because traditional research investigations generally lack the resources to cover larger ecosystems and processes. Studies imply that community-based research activities can be particularly valuable to knowledge production in remote, vast areas to which ordinary researchers have little access.[134] Students are also increasingly being involved in gathering data and performing investigations of various kinds related to sustainability and societal challenges.[135]

Critical remarks:
Citizen research has limited possibilities, and data might be partially unreliable due to ”variation in observer quality”.[136] Moreover, just like in any participatory model for knowledge production, power relations need to be acknowledged and managed if citizens are to be included as co-producers of knowledge and not merely providers of data.

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[134] Schick, Axel et. al. 2017. ”People-Centered and Ecosystem-Based Knowledge Co-Production to Promote Proactive Biodiversity Conservation and Sustainable Development in Namibia”. *Environmental Management* vol. 62. 858-876.

[135] Trencher, Gregory et al. 2015. ”Student Participation in the Co-creation of Knowledge and Social Experiments for Advancing Sustainability: Experiences from the University of Tokyo”. *Environmental Sustainability* vol. 16. 56-63.

[136] Dickinson, Janis L., Benjamin Zuckerberg and David N. Bonter. 2010.”Citizen Science as an Ecological Research Tool: Challenges and Benefits”. *Annual Review of Ecology, Evolution, and Systematics* vol. 41. 161-162.

Design Science

Design Science is a problem-solving approach focussing on the development of useful artefacts that are applicable in various contexts and are supported by structured research processes.[137] It consists of five phases:

1. Explicating the problem.
2. Outlining the artefact and defining its requirements.
3. Designing and developing the artefact.
4. Demonstrating the artefact.
5. Evaluating the artefact.

As shown, this approach has a substantial emphasis on physical, practical product development, although not categorically excluding service design. In contrast to Design Thinking, Design Science has relatively little space within the design process designated for user research.

Critical remarks:

Design Science is a highly structured approach towards solving practical problems and is well embedded in a natural scientific tradition of hypothesising, testing, and failing. However, it lacks a holistic perspective and risks overlooking the importance of local or user knowledge and instead becoming a top-down provision of solutions for others. Thus, it might prove less feasible for co-creative processes because involvement of the user in creating the solution becomes less obvious or possibly redundant.

Design Thinking

Design Thinking was developed at Stanford d.school. It consists of using the basic principles and tools from the design profession in order to solve practical problems. The method is visualised as a "double diamond", i.e. a process in which the view of the problem shifts from narrow to broad, or specific to general, and then back again, repeated twice. The double diamond goes through five stages:

1. Empathise with the users.
2. Define the problem.
3. Ideate possible solutions.
4. Prototype selected solutions (products, services, or concepts).
5. Test solutions.

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[137] Johannesson, Paul & Perjons, Erik. 2012. *A Design Science Primer.* Creative Commons, unported license. 9-10.

The Design Thinking process is imbued with iteration, and steps in the process are tried out in several cycles in order to increase the likelihood of solving the problem. This also speeds up the first design cycle because no prototype is ever considered definite. Another quite essential feature is empathy for and understanding of the users and need-owners. This is achieved by rigorous observation, critical analysis, interviews, and research, while assuming a "beginner's mind-set" to be open to others' experiences and needs. The starting point is that the users' own knowledge constitutes an essential basis for successfully creating solutions.

Critical remarks:
Design Thinking's greatest strength is its ability to produce unthought-of products and services aiming at improving quality of life and overcoming obstacles in almost any given situation involving human activity. This includes sustainability challenges to a high extent. However, Design Thinking largely lacks a systemic aspect, or at least does not require one in order to be conducted. This risks leading to designing solutions for isolated contexts regardless of surrounding structural prerequisites affecting the problem. It is therefore highly necessary to integrate Design Thinking with a systems approach.[138] Moreover, the "beginner's mind-set" approach has received its share of critique – not without reason – for being positivist and unrealistic because one can hardly be expected to erase personal presuppositions in scientific work just as for anywhere else.[139]

GAIT: Systems Change in Open Networks
GAIT (Guild of Agents for Intentional Transformation) is a network for change agency initiated by organisational consultant Eugenio Moliní.[140] Though not a method in itself, the network uses some basic principles for enabling *Systems Change in Open Networks*, including systemic or organisational change through cooperation and, among other forms, co-creative multi-stakeholder partnerships. Its starting point is the *Communety of Practice* [sic], or CoP, signifying a particular collective with the intention to "increase the impact of change interventions and diminish the pain caused to others, ourselves and the system".[141] It distinguishes between four ideal types of CoPs:

1. Internal CoPs formed by change agents within the same organisation.
2. CoPs formed by internal change agents from different organisations.

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[138] Conway, Rowan et al. 2017. *From Design Thinking to Systems Change: How to Invest in Innovation for Social Impact.* London. RSA Action and Research Centre.

[139] Snodgrass, Adrian & Coyne, Richard. 1997. "Is Designing Hermeneutical?". *Architectural Theory Review* vol. 1 no. 1. 91-93.

[140] http://molini.es/es/equipo/ Accessed 10 April 2019.

[141] http://molini.es/es/gait-guild-of-agents-for-intentional-transformation/ Accessed 10 April 2019.

3. CoPs formed by freelancing change agents, such as consultants or independent advocates of particular causes.
4. CoPs as multi-stakeholder partnerships or interdependent stakeholders and organisations within the same social-ecological system with different agendas.

GAIT then proceeds to design specific process objectives for each of these ideal types. For example, depending on organisational dependence, change agents need to exert various forms of influence over the services they develop together. In type 2, change agents are usually organisational seniors or consultants with vast networks and the independence to act on their own initiative. They need to view the results of their CoP as freely accessible services to the world rather than as privately owned and commercialised products.

In type 4, which is the ideal type most closely associated with the selected processes in this report, aspects such as mistrust, internal vs. common agendas, and neutral, external facilitation need to be managed, and by default this type requires more resources than the other ideal types.

Critical remarks:

The assessment of CoP and the procedure taught within GAIT can contribute substantially to raising awareness regarding the co-creation process among participating actors. However, it is limited in scope and gives few specifics regarding power relations, the inclusion of different stakeholder groups, and contesting epistemologies.

LEADER

LEADER (”Liaison Entre Actions de Dèveloppement de l’Economie Rurale”), or *locally led development*, concerns the involvement of local stakeholders in shaping the future of local societies, especially in rural and less dense urban areas. The concept has been used for about 20 years and is based on the EU Common Provisions Regulations decrees on local development. The principle of LEADER is to develop a local area on its own particular terms across sectorial boundaries. The model is called the ”trinity” of partnership, territory, and Local Development Strategy.[142]

Private, civil, and public sector actors agree upon prioritised areas of development within a specified time and space. This type of partnership constitutes a *Local Action Group (LAG)* and their limited space a LEADER Area, of which Stockholm is one. Local project applications within a LEADER Area are subject to evaluation by the LAG and possibly granted financial support. The main objective of the LAG is to support long-term self-sustaining initiatives rather than continuously funding them. A Spanish study on LEADER aid in the local area of Extremadura concludes:

“It has become evident that these aids are benefiting the most dynamic areas and the more established sectors of the region. Furthermore, in other more depressed areas, the

[142] European Network for Rural Development. 2016. LEADER Local Development Strategies: Guidance on design and implementation. 2-3.

development of tourism and the rehabilitation of degraded historical and natural heritage are being carried out."[143]

Critical remarks:

The LEADER method is an internationally acknowledged strategy for creating commitment in rural, less populated, or generally overlooked areas. It puts a strong emphasis on not settling for one form of knowledge but rather enforces and encourages integrated knowledge and experimentation through collaboration. However, being governed at the EU level, with its bureaucratic requirements, LEADER poses challenges regarding its incentives. A study of Czech LAGs concludes, among other observations, a "lack of incentive for the LAG to undertake innovative projects" correlating to what is perceived as rigid EU administrative demands from the LEADER area.[144]

Mission-driven innovation

As a framework for stimulating cross-sectorial collaboration in order to solve complex challenges, mission-driven innovation is considered a proven approach to helping actors to initiate co-creative partnerships across sectors. The fundamental principle of mission-driven approaches is to set clear, limited, yet ambitious objectives within specific timeframes. Historically, this is likened to the first man on the moon being established as a goal to be reached before the end of the 1960s, leading to the ignition of a vast collaborative effort for innovation across a range of professional fields. Other more recent examples are the German *Energiewende*, the stated mission of reducing carbon emissions through such targets as abolishing nuclear power production by 2022, and – on a broader scale – the global SDGs of Agenda 2030.[145] Co-creation comes in as one of the four main keys to successful mission-driven innovation as presented by the European Commission, recommending "taking a problem focussed lens and not a sectorial lens".[146]

Critical remarks:

Mission-driven innovation is highly sensitive to a range of more or less unforeseeable factors during the whole process, thus requiring a high degree of flexibility for new solutions and operations. For example, it is recommended that budgets for mission projects are constructed so that extra funds can be added in the case of unanticipated requirements along the way. Moreover, mission-driven projects put high demands on in-house knowledge of participating organisations. However, the current rule for most organisations is to utilise third-party expertise (e.g. private consultants or think tanks) rather than

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[143] Masot, Ana Nieta & Cárdenas Alonso, Gema. 2017. "Análisis del Método Leader (2007-2013) en Extremadura mediante técnicas SIG y Análisis Multivariado". *Cuadernos Geográficos* vol. 56 no. 1. 148-171.

[144] Svobodová, Hana. 2015. "Do the Czech Local Action Groups Respect the LEADER Method?" *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis* vol.63 no. 5. 1774.

[145] Mazzucato, Mariana. 2018. *Mission-Oriented Research & Innovation in the European Union: A problem-solving approach to fuel innovation-led growth*. Brussels: European Commission. 13-14.

[146] Mazzucato. 2018. 15.

cultivating the capacity of one's own organisation. Although this poses a challenge, the European Commission report mentions, among other examples, Sweden's Vinnova as a best practice in fostering the mission approach.[147]

Not Boring

"Not Boring" was developed at Urban ICT Arena as a particular approach to innovation. It is a loosely formulated mind-set of visualising unexpectedness, value, fun, and craziness, and consequently it follows logical steps in order to realise the ideas produced from this mind-set.[148]

Critical remarks:

As is the case with Design Thinking and Design Science, Not Boring creates prerequisites for innovative solutions potentially disregarding systemic perspectives.

Transition Management

Transition management has emerged as an approach aiming to maximise sustainable transformations of existing urban systems based on a range of principles. It is a framework for enabling actors and stakeholders to influence the governance of sustainable transitions by problematising power and ownership aspects that are highly connected to implementing and steering sustainable solutions.[149]

For example, it views pollution and over-consumption largely as systemic symptoms, thus focussing on transforming systems.[150] Transition management is essentially based on elements aligning with co-creation and transdisciplinarity and is the bringing together of knowledge from all societal sectors in order to develop a shared understanding and problem formulation, jointly elaborating strategies and visions as well as jointly experimenting and implementing strategies and innovations.[151]

Critical remarks:

Transition Management strongly emphasises systemic perspectives and holistic approaches; however, this poses challenges for innovative and co-creative methodologies because the level of abstraction specifies little regarding how different stakeholders and diverse knowledge can actually be brought together. Van Poeck et al. remark that the consciously

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[147] Mazzucato. 2018. 18-19.

[148] http://www.urbanictarena.se/notboring-the-method/ Accessed 25 June 2019.

[149] Wittmayer, Julia M. & Schäpke, Niko. 2014. "Action, research and participation: roles of researchers in sustainability transitions". *Sustainability Science* vol. 9. 484.

[150] Loorbach, Derk and Shiroyama, Hideaki. 2016. "The Challenge of Sustainable Urban Development and Transforming Cities". Loorbach, Derk, Wittmayer, Julia M., Shiroyama, Hideaki, Fujino, Junichi, Mizuguchi, Satoru (ed.). *Governance of Urban Sustainable Transitions: European and Asian Experiences*. Springer Japan. 9.

[151] Wittmayer, Julia M. and Loorbach, Derk. 2016. "Governing Transitions in Cities: Fostering Alternative Ideas, Practices, and Social Relations Through Transition Management". Loorbach et. al. *Governance of Urban Sustainable Transitions.* 13-18.

designed new spaces within which transitions are meant to take place are never unbiased or neutral, and to assume so is to disregard fundamental aspects of power relations between, for example, public governance and civil society. Instead, more attention needs to be paid to creating spaces for diverse and even conflicting opinions and teachings of sustainability challenges.[152]

[152] van Poeck, Katrien, Vandenabeele, Joke & Goeminne, Gert. 2017. ”Making climate change public? A dramaturgically inspired case-study of learning through transition management”. *International Journal of Global Warming* vol. 12 no. 3/4. 366-385.

Concluding discussion

Again, it is important to note that this assessment focuses primarily on diversities and regularities among the studied processes in order to draw notable conclusions about the current state of the field of sustainable co-creation. It should thus not be regarded as a grading procedure.

Most processes involve many different stakeholders from diverse fields and sectors on a high level of intensity of involvement (co-producing) – 13 processes involve four sectors on a high level, another 13 involve three sectors, and the remaining process involves two. This implies that most stakeholders and forms of knowledge have contributed to the results of the processes. It does not, however, show how this contribution has been accomplished. Contributing actively to a process does not mean that each actor is provided equal opportunity to define the problem or to generate ideas with which to manage it. It might thus still be the case that one particular actor wields excessive influence over the process in which they are involved, thereby exerting control over the nature of other actors' contributions.

A general understanding of the incentives for co-creation concerns the complexity of the problem at hand, the necessity of involving need-owners, and the insufficiency of one sector or organisation in managing the problem. However, the interviews also reveal the importance of financial incentives for initiating co-creative projects.

Challenges and factors affecting the co-creation process are interrelated in a complex web concerning individuals, time constraints, the modalities of inclusion and commitment practices, the financial, social, and epistemological dispositions of participating actors and organisations, the legal and societal institutions, and the amount of funding and the funding processes. The stability of these processes might therefore be affected considerably on all levels, from institutional and supra-national structural factors down to participating individuals, organisations, and their interrelations.

Low or non-existing involvement of local actors is correlated with more generalisable, large-scale ambitions. Processes operating as platforms with little or no joint contribution to outcomes from participating actors tend to omit using strategies and methods for co-creation. Local processes with a joint contribution might be less likely to involve actors from academia on a high level.

The main distinction among the processes, however, is the issue of supporting the co-creation process itself. Whereas all processes share a fundamental understanding of *why* co-creation is necessary and *how* the process might be affected, less than half of them, 11, describe *what* a strategic and structured practical response to the observed factors affecting the co-creation process might look like. Equality between actors and knowledge forms, fostering a joint early dialogue for problem formulation, maintaining focus and efficient use of knowledge, horizontal and transparent organisation, including actors throughout the process, and strong flexibility and adaptability regarding objectives, procedures, and the dispositions of involved actors are acknowledged as the most important practical responses for supporting co-creation. The process of jointly formulating and defining the problem appears to have taken a year or more for most of the studied processes.

When it comes to the issue of mitigating power differences between unorganised citizens on the one hand and more organised and resource-abundant actors on the other, only seven out of 19 processes assume an active role. Although there are several practical reasons for this rather low number, such as citizens only having a limited role throughout the process, it should provide interesting implications for future studies.

The use of methods and strategies for co-creation

On a strategic level, the responses to factors affecting the co-creation process particularly concern the establishing and maintaining of equal opportunities and equal voices between thought styles and across sectorial boundaries, which might be enhanced through transparency of results and data as well as by a democratic process in which decision-making is consensus-based or vote-based to the greatest extent possible. This also requires a delicate adaptation to the different dispositions of involved actors, in other words, empathy work. Inclusion is also enhanced by a coherent procedure in which relevant actors are involved in all stages rather than to limited parts of the process or being excluded after an initial joint process. Targeting the early dialogue process is a strategically advantageous response because it proactively sets the process up for enhanced shared understanding regarding the problem and problem definition. This might also be combined with a strict focus on certain thematic issues because actors (rarely agreeing on all aspects of the problem) might otherwise drift into less relevant debates, consuming precious time. When structuring the co-creation process, the various types of expertise and knowledge are acknowledged and put to use. As a means for neutralising and mitigating power imbalances and interpretative prerogatives among the different participating actors, flexibility with meeting locations and a general de-centralisation of the process is deemed beneficial. Flexibility also refers to the overall ambitions and objectives of the process, and the co-creation process might indeed be aggravated by taking a strict attitude towards the initial agenda.

Several processes do foster co-creation through their choice or development of a strategic framework, including mission-driven innovation, GAIT, LEADER, and Transition Management. These frameworks, however, might not display direct operational responses for how to manage the multi-stakeholder and transdisciplinary setting of co-creation by supporting the integration of knowledge and the inclusion of stakeholders.

On a more operational level, several processes mention the advantage of non-conventional methods and innovative practices as a beneficial means for co-creating. Such methods include citizen research, Design Thinking, Design Science, and Not Boring. However, these approaches also do not categorically ensure specific means for effectively supporting the co-creation aspect of a process, although they might contribute to it.

Many on-going co-creative processes are well-run and well-funded, and there is rarely a lack of creativity, capability, experience, or knowledge among the actors involved. However, there are some main implications for the long-term, large-scale impact of such efforts that must be considered if the Stockholm Region is to achieve the UN SDGs.

Fragmentariness

There is little or no coordination among the processes on a regional policy level. Decision-makers only administer the scaling up of a few of them, namely Odlande Stadsbasarer and

Norra Djurgårdsstaden, which are also coordinated by the City of Stockholm, and ElectriCITY, which is part of the sustainability hallmark Hammarby Sjöstad. This fragmentariness leads to short-sightedness among the majority of the studied processes, many of which are driven by an incentive to renew, reinvent, and improve areas in need of a more favourable public image, whether these areas are socio-economically disadvantaged, peripherally located, or both. This essentially means that co-creation for sustainability can become a means to an end for municipalities to gain competitive benefits. While competition and export opportunities might be a productive driving force for sustainability, the apparent lack of joint vision might result in a lack of incentives for scaling up successful processes to reach their full potential. Moreover, less concerned municipalities and areas are more likely to remain passive with regards to co-creation, as is the case today. Co-creation initiatives involving more than two sectors are not observed in some of the more prosperous areas in the region.[153] These findings correspond to an earlier mapping of local sustainable initiatives conducted by the ARTS project in 2014–2016.[154]

The region's sustainable development challenges are relatively decentralised. This might indeed be desirable. Several of the studied processes – such as Bagarmossen, Enable, LEADER, #UrbanGirlsMovement, and DataSmart – appear to benefit in terms of creativity and knowledge integration from not being steered by authorities or large organisations. Allowing for a balance between central and local perspectives, between universal and particular challenges and solutions, could remain a desirable imperative. However, the fact remains that many of the processes lack awareness of co-creation as a craft of its own, requiring additional resources and professional knowledge in order to function properly.

The studied processes display a general lack of network opportunities and knowledge exchange between each other, as well as a lack of self-awareness of being a co-creation process. A broader process of mutual learning and exchanging experiences across thematic boundaries is still non-existent. Furthermore, all processes similar to the ones mentioned in this report might benefit from a more efficient dialogue with the region's policy-makers for exporting and communicating their best – and possibly also worst – practices, learnings, and solutions, as would policy-makers because it would enhance their own capacity for enabling Stockholm to meet the Agenda 2030 SDGs. Currently, there is a lack of continuity of close policy dialogue with representatives from all regional municipalities and the regional governance, while simultaneously remaining in need of local and organisational autonomy in relation to governance structures. A national network bringing together knowledge, experiences, and representatives from all larger urban regions in Sweden is equally absent today.

Time might also be saved when writing applications and knowledge might be exchanged on a broader and earlier level than is the case today by bringing together actors preparing applications for agencies such as Vinnova and the EU structural funds.

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[153] For example, Danderyd, Ekerö, Lidingö, and Vallentuna appear to be 'blind spots' of more complex forms of co-creation in the region.

[154] Borgström. 2016. 11.

Vocabulary

A lack of knowledge exchange is mirrored in the observed vocabulary, and a substantial proportion of respondents do not seem to acknowledge or comprehend synonyms of the concept of "co-creation" (Swedish: *samkunskapande, samskapande, medskapande, samproduktion, samhandling*) even though all are familiar with the more mainstreamed concepts of "collaboration" or "synergy" (Swedish: *samverkan*). The studied processes do not share an ontological or conceptual understanding regarding co-creation, let alone the fundamental purpose of the mapping preceding this report. There does not appear to currently exist a coherent discourse among the various processes, despite performing similar activities. Rather, representatives seem to prefer utilising concepts akin to their own organisation or discipline.

The lack of shared vocabulary is not a surprising observation, and as depicted in the Introduction part of this report, co-creation itself emanates from a broad range of disciplines and conceptual traditions. Nevertheless, these conditions pose a challenge to the possibilities of co-creative efforts for sustainable development. Facilitation of and accessibility to a comprehensive and translatable vocabulary for co-creation might be necessary in order to accelerate the joint efforts for Agenda 2030. This would require various educational operations, such as official glossaries, facilitation methods, or handbooks. Linguistic facilitation of co-creation has thus far ushered in few practical examples[155], although Stockholm University recently established a Wikipedia-style glossary called *Samsyn* with the purpose of explaining concepts frequently used within cross-sectorial collaboration.[156]

Degree of professionalisation

The lack of coherent vocabulary on co-creation ultimately seems to correspond to a lack of professionalisation of the field itself. Currently, there exists no commonly accepted authorisation of managers of co-creation processes. Consultants, designers, architects, researchers, or anyone deemed suitable from the coordinating organisation might be assigned the task of facilitating co-creation. This most likely leads to asymmetries in process management. While most studied processes lack a coherent vocabulary, awareness, and professional approach with regards to co-creation, some processes do. Respondents from DataSmart, #UrbanGirlsMovement, Enable, and Rosendals Trädgård display substantially higher degrees of not only awareness regarding design and problematisation of co-creative efforts, but also of the concept itself and its theoretical background, history, and contextuality.

Expertise on co-creative mechanisms and tools are currently not integrated into larger organisations and contexts; rather, these are procured from private, academic, or civil

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[155] Weber, Tilo. 2018. "Language matters in transdisciplinarity". October 2. https://i2insights.org/2018/10/02/language-matters/ Accessed 25 June 2019; Nikulina, Varvara et al. 2019. "Lost in translation: A framework for analysing complexity of co-production settings in relation to epistemic communities, linguistic diversities and culture." *Futures* vol. 113 no. 102442 (Forthcoming October 2019).

[156] https://samsynwiki.su.se/wiki/Huvudsida Accessed 25 June 2019.

actors. Further recognising co-creation as a complex assignment and profession through titles, professional regulations, and requirements in funding processes might prove vital in promoting successful co-creation.

The role of research involvement is particularly important to consider for all actors working with co-creation. Apart from producing niched expert knowledge, researchers have considerable potential of steering, facilitating, and consciously guiding co-creation processes. They might also provide more advanced theoretical perspectives of co-creation, offering a critical gaze to an otherwise fast-paced and solution-oriented process. However, some processes merely use researchers for evaluating their results. In some cases, researchers work almost completely isolated from practical work, which risks leading to loss of potential, although it may well seem more feasible to process coordinators.

Competition

Sustainable innovation might well be regarded as a market in which actors compete for funding and leverage of their own developed ideas, products, and services. Competition contributes to professionalism and quality, but it also puts the various processes at very different dispositions. This is another potential obstacle for network building and knowledge exchange as described above. Not every co-creation process might be eligible for Vinnova, EU, or other sources of stable funding because their solutions or ways of working might not live up to their fundamental requirements. This entails the risk of overlooking some of the less organised and grassroots initiatives as well as research projects, even though they might prove vital for sustainable development in the region. Thus, broader bases for funding of sustainable co-creation might add value to the sustainable development of the Stockholm Region.

Mistra Urban Futures strives towards Realising Just Cities which are Accessible, Green and Fair.
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