

STUCK IN THE MIDDLE WITH YOU: THE ROLE OF BRIDGING ORGANISATIONS IN URBAN REGENERATION

Stephan Kampelmann

*Université libre de Bruxelles / SBS-EM, DULBEA, CEB
University of Stuttgart / Institute for landscape planning and ecology*

Sarah Van Hollebeke

Université Catholique de Louvain

Paula Vandergert

University East London / Sustainability Research Institute

Abstract

The literature on the governance of social-ecological systems increasingly recognizes a key role of bridging organisations (BOs) in transition processes towards sustainability. BOs can be defined as facilitators who allow for interorganisational collaboration. Our paper provides a more nuanced understanding of specific BO activities and their contributions towards urban sustainability. Our analysis is based on applying three complementary methodological angles (drawing on geolocalised data, interviews and action research) to 20 years of urban renovation investments in the city-region of Brussels. We distinguish between multi-scale, multi-actor and multi-dimensional tensions in urban renovation programmes and link these tensions to bridging challenges for BOs. Results suggest that the corresponding three types of bridging roles form a trilemma rather than a trilogy: the BOs in study have mediated one tension by de facto exacerbating another. Lessons from action research suggest that a wider use of temporality and shared language to communicate about urban renovation projects could attenuate the bridging trilemma.

Key words: urban regeneration; social-ecological systems; governance; bridging organizations; mediation

1. Introduction

Numerous city-regions are affected by strong global pressures such as climate change, resource depletion and energy security that can be seen as “new challenges and pressures on urban growth and to the management of cities’ critical infrastructures” (Hodson and Marvin, 2010; p. 477). In their review of 30 years of urban regeneration projects in Britain, Germany and France, Couch et al (2011) have identified deindustrialisation, the globalisation of production chains, demographic change, obsolete urban structures, degraded environments and low-quality housing as common pressures in many city-regions.¹ One way cities can respond to these macro challenges is through ‘urban regeneration’ (also referred to as ‘urban renovation’, ‘urban revitalisation’, ‘urban renewal’ etc.), i.e. proactive interventions aimed at overhauling parts of urban systems.

The need for cities to adapt to these macro pressures has spurred considerable interest of both decision makers and academics for urban regeneration policies (Hill et al, 2012; Cowell, 2013; Nolan and Wong, 2004; Glaeser and Gottlieb, 2008; Busso et al, 2013). Examples of these policies include the “City Deals” in the UK, the “Empowerment Zone Program” in the US, the “Zones Franches Urbaines” in France or the “Neighbourhood Contracts” in Belgium. Also many investments in so-called “Urban areas in difficulty” under Objective 2 of European Union development funds, for instance in former industrial cities in Eastern Germany and Northern France, are essentially urban regeneration policies.

The overall research objective of this article is to investigate whether the importance of bridging roles that has been identified in the wider sustainability literature – especially in social-ecological system theory and transition theory – also applies to the specific case of the implementation of urban regeneration programmes. While different strands of the literature in ecological economics and related fields underline that bridging organisations can be instrumental for transitions towards sustainability, our paper fills an important gap by being the first to examine empirically the incidence and success of bridging activities in the context of urban regeneration. We argue that this is a highly relevant

¹ We use the terms ‘urban agglomerations’ and ‘city-regions’ interchangeably. Following Le Corbusier, an agglomeration can be defined by its limits: the area of influence of another agglomeration (Le Corbusier, 1957).

contribution to the sustainability literature: despite the fact that BOs “appear to be essential for building the capacity to adapt to change” (Folke et al, 2005), the incidence and success of bridging roles in urban regeneration programmes, arguably one of the most purposive policies driving urban change, have so far not been studied in the literature.

The article is structured as follows. Section 2 defines bridging organisations and discusses different conceptualisations of bridging roles in two strands of the sustainability literature. Section 3 presents our research approach based on three complementary empirical angles, specifying for each angle the related research questions, empirical data and methods. Section 4 describes our empirical results for the case of the main urban regeneration policy in Brussels, Belgium’s largest city-region with a surface of 161 km² and 1.2 million inhabitants. Through this policy, called “Neighbourhood Contracts” (NCs), 1.14 billion euros have been invested over the last twenty years. The NC programme brings together local, regional and federal actors and allows studying bridging roles across scales, actors and dimensions of urban regeneration over a long period. Section 5 discusses our empirical findings in light of the extant literature and the final section concludes.

2. Bridging organisations and urban regeneration

2.1 Definition of bridging organisations

When scholars refer to ‘bridging’, they use the term as metaphorical reference to an actual bridge, i.e. a physical object that provides a causeway over a ravine, a canyon or a river (Sapsed et al, 2007). The metaphor of a bridge evokes at least three elements: an obstacle or gap that renders communication or exchange difficult or even impossible; two or more sides that are separated by this obstacle; and a deliberate intervention designed to overcome the separation between the different sides. The bridge metaphor is a very common figure of speech and is employed extensively in the literature on sustainable development (e.g. Gunderson et al, 1995; Candemir and van Lente, 2007).

A more specific meaning of the metaphor associates it to a special type of organisation – ‘bridging organisations’ or BOs – whose objectives are, perhaps not exclusively but to a significant degree, directed at overcoming barriers to cooperation on more sustainable approaches to environmental problems. For Brown (1991), these barriers include horizontal communication difficulties between local communities engaged in environmental resource management, but also vertical barriers between local communities and higher scales of governance, such as regional, national or international governments. Westley’s (1995) use of the term emphasizes a specific outcome by defining bridging organisations as ‘interorganisational collaboration’; this term includes collaboration between “different and similar actors and stakeholders across and within organisational hierarchies and types” (Westley, 1995).

In the sustainability literature, the thus defined term has been applied to a large variety of organisations. The latter may differ with respect to the organizational form of the BO and includes associations, networks, cross-sectoral partnerships, political coalitions or social movements (Brown, 1991). Moreover, the initiative to a bridging organization may be bottom-up or top-down (Hahn et al, 2006). As an example for one of the many different actors labelled as BOs we cite the Ecomuseum Kristianstad Vattenrike, which is discussed by Hahn et al. (2006). In this case, the BO emerged with the purpose of overcoming scattered knowledge and policy responses to a perceived crisis in wetland landscape management in southern Sweden.

Because the bridging metaphor encompasses so many types of organisations engaged in different forms of ‘barrier removal’, the meaning of BOs partially overlaps with other concepts such as ‘boundary organizations’ (Cash and Moser, 2000) or ‘intermediaries’ (Kivimaa, 2014). According to Folke et al. (2005), the definition of BOs is wider and encompasses all the functions of a boundary organisation. We argue that BOs can also provide some functions of intermediaries, which is why we hypothesize that some of the roles associated with intermediaries in sustainability transitions can also apply to BOs in urban regeneration programmes (see Section 2.2.3).

2.2 Overview of bridging roles in the sustainability literature

This section reviews two strands of the literature on sustainability – namely ‘social-ecological systems theory’ (Section 2.2.1) and ‘transition theory’ (Section 2.2.2) – in order to identify the different roles pertaining to BOs. We then discuss how some of these roles could also apply to BOs operating in the context of urban regeneration programmes (Section 2.2.3).

2.2.1 Bridging in social-ecological systems

According to Plummer and Armitage (2007), the development of social-ecological system (SES) theory reflects interdisciplinary efforts to combine insights from natural and social sciences in order to improve our understanding of complex systems involving both anthropogenic and ‘natural’ elements (Berkes and Folke, 1998). An extended definition has been provided by Weisz et al. (2001), who see SES as “comprising a ‘natural’ or ‘biophysical’ sphere of causation governed by natural laws, and a ‘cultural’ or ‘symbolic’ sphere of causation reproduced by symbolic communication”. In this conceptualisation of SES, the overlap between the ‘natural’ and ‘cultural’ spheres constitutes the “biophysical structures of society” (Haberl et al, 2004).

The complex interactions between society and biophysical materialities within SES provide the scope and necessity for BOs (Hahn et al, 2006). On a very general level, the latter can help to connect the natural and cultural spheres of causation (Fischer-Kowalski and Haberl, 2007). On a more specific level, the environmental resources that are extracted from natural ecosystems and integrated in the biophysical structures of society can be managed through very different societal arrangements that vary with respect to their sustainability and their resilience. A range of studies has pointed out that these environmental resource management arrangements lead to more sustainable and resilient outcomes if they are able to integrate knowledge from multiple strata of governance and from multiple sectors of society, for instance in the form of co-management arrangements, implying in turn the need for bridges across strata and sectors (Hahn et al, 2006; Ostrom, 2016). It is for this reason that “the role of bridging organisations has been extensively studied in the literature in environmental governance in the specific context of formal co-management arrangements” (Dedeurwaerdere et al,

2015; p. 27). These studies have provided ample evidence that BOs often have the capacity to create horizontal linkages and information flows across sectors and scales (Brown 1991; Vignola et al. 2013).

In addition to the wider idea of bridging between ‘natural’ and ‘cultural’ spheres of causation, BOs have been associated with a series of more specific roles. Brown (1991) has argued that BOs help local stakeholders to articulate visions and expectations about environmental resources and their management, and afterwards to translate visions and expectations into material actions. Hahn et al (2006) describe the role of BOs as “providing an arena for trust-building, vertical and horizontal collaboration, learning, sense-making, identification of common interests, and conflict resolution” (p. 586). Similarly, Folke et al (2005) say that the role of BOs can be to lower the costs of collaboration and conflict resolution. Berkes (2009) finds that BOs provide “a forum for the interaction of different kinds of knowledge, and the coordination of other tasks that enable co-operation: accessing resources, bringing together different actors, building trust, resolving conflict, and networking.” Focusing on the aspect of knowledge creation, Dedeurwaerdere et al. (2015) state that BOs “organise knowledge co-production and social learning amongst the various actors and types of knowledge” (p.27).

2.2.2 Bridging in transition theory

Transition theory is a rapidly expanding body of research on how societies move between successive socio-technical configurations. Such transitions are ‘socio-technical’ because they are defined as encompassing social (e.g. in organisations or governance structures) as well as technical transitions (e.g. in infrastructures or biophysical systems). A central tool for transition theory has been the ‘multi-level perspective on socio-technical transitions’ (Geels, 2005) that comprises three interrelated levels: the landscape (macro) level represents broader conditions, opportunities or pressures for transitions; the regime (meso) level refers to the sum of institutions, regulations, policies and other manifestations of the dominant socio-technical configurations; the niche (micro) is a place that is relatively protected from the pressures of the dominant regime and which therefore provides a space for experimentation and innovation with new or alternative socio-technical configurations (Kemp et al, 2007).

Only a handful of studies using transition theories have focused on activities and roles that can be associated with the bridging metaphor and BOs. To our knowledge, these studies are limited to the contributions by van Lente et al. (2003), Hargreaves et al. (2013), Hodson and Marvin (2014) and Kivimaa (2014). These authors have in common that they conceptualise some of the activities that we refer to as ‘bridging’ between different stakeholders, interests, types of knowledge, etc by using the term ‘intermediation’. As a consequence, these studies refer to ‘intermediaries’ in transition processes. As stated above, however, we argue that our definition of BOs encompasses intermediation and we think that some of the roles associated with intermediaries in sustainability transitions can also be performed by BOs as defined in this article. The partial overlap between conceptualisations of bridging and intermediation is also reflected by the fact that the bridge building metaphor is also used in literature on intermediaries (e.g. Candemir and van Lente, 2007; Sapsed et al, 2007; Klerkx and Leeuwis, 2009).

A highly relevant study for our purposes is Kivimaa’s (2014) analysis of intermediary roles in transition-relevant processes within niches. Based on a comprehensive literature review on intermediary roles, Kivimaa groups the latter into four broad categories: articulation of expectations and visions; building of social networks; learning processes and exploration at multiple dimensions; and other roles. The last category includes roles related to the implementation of socio-technical transitions, including project design, management and implementation as well as policy implementation.

In addition to distinguishing between different roles of intermediaries in socio-technical transitions, transition scholars have also discussed factors that explain the success of certain roles in leading to the desired outcomes. Hodson and Marvin (2010) argue that the capacity and capability of intermediaries to foster ‘systemic’ urban socio-technical transitions is related to 1) their organisational stability and broad-based longer term funding, 2) a shared collective organisational culture, 3) a constantly developing knowledge base, 4) alignment of multiple sets of social interests and the creation of communication forums that enable these alignments, 5) differentiated representation of intermediation according to different interlocutors, and 6) the embeddedness of the intermediaries in a specific urban

context. Kivimaa (2014) identified neutrality – which the two Finnish organisations she analysed derived from their relative financial, political and technological independence – as another factor of successful systemic intermediation. According to her study, the relationship between the temporality of intermediaries and their capacity to drive systemic socio-technical transitions seems to be ambiguous. On the one hand, shorter and more project-oriented engagements render intermediaries less prone to be locked into the dominant regime. On the other hand, systemic transitions require sustained engagement over longer periods as “both altering mental states and technological innovation take time” (p. 1379).

2.2.3 Roles of bridging organisations in urban regeneration

We now discuss to what extent the roles associated with BOs (or reasonably close concepts) could be relevant in the specific context of urban regeneration programmes. While there are no previous studies on this issue that we are aware of, we can draw some insights on the potential role of BOs in urban regeneration from the handful of empirical studies that analyse trajectories of urban social-ecological systems (Duvigneaud and Denaeyer–De Smet, 1975; Weisz and Steinberger, 2010; Krausmann, 2013; Kohlbrenner, 2014; Barles, 2015) or socio-technical transitions at the scale of cities (Hodson and Marvin, 2010; Perry and May, 2010; Bulkeley and Castán Broto, 2013).

As an example of studies on the trajectories of urban SES, we can use the recent analysis by Barles (2015) regarding the evolution of the SES of Paris over the last two centuries. The Parisian system seems to have evolved towards “considerably more complex” infrastructures, a development that was accompanied by an increasing number of intermediaries and the incorporation of ever more distant ecosystems to provide the resources for the city, but also to absorb its pollution and waste. Krausmann (2013) provides similar results for the case of Vienna and Kohlbrenner (2014) for Brussels. As a consequence of these developments, the interactions between the ‘natural’ and ‘cultural’ spheres of causation in SES become more complex. Especially when these interactions span multiple scales of governance – for instance when the city of Paris draws freshwater from a large bassin that is not under the city’s formal authority – it is often unclear who has the power to decide on the course of the city’s

evolution and which trajectories are more sustainable for the SES as a whole. As a consequence, due to the centrality of complex infrastructures and potentially competing interests at different scales in large interconnected systems around urban agglomeration, we argue that the beneficial roles of BOs in SES are particularly salient in the case of *urban* SES. In other words, the aforementioned overlap between society and nature in the form of the ‘biophysical structures of society’ (Fischer-Kowalski and Haberl, 2007) is probably the most tangible and consequential in the case of cities, because the latter consist more than any other SES of infrastructures. In the industrial regime, many of these urban infrastructures have been designed to use fossil energies and allowed for unprecedented urban growth that has contributed to a large extent to resource depletion, biodiversity loss and other global environmental problems (Folke et al, 1997). In this context, urban regeneration programmes are opportunities to adapt urban SESs in order to make them more sustainable. Due to the impact of cities on much larger ecosystems, urban regeneration has a very high potential environmental leverage, but whether the opportunities of urban regeneration will be effectively used appears to depend at least to some extent on the existence and capacity of BOs to play some of the roles identified in the SES literature reviewed above. These roles are summarised as roles R1-R10 in Table 1.

As for theories on socio-technical transitions applied to cities, we conclude from the existing studies on urban transitions that bridging roles are potentially helpful for bringing about urban sustainability transitions. If we consider urban regeneration programmes within the multi-level perspective, most of the drivers that create the need for regeneration are situated at the level of the landscape: from the viewpoint of a city, secular trends like the deindustrialisation of Western European agglomerations happen at the macro scale on which most cities have no direct influence. Faced with a changing landscape cities can, however, act as laboratories in which new socio-technical configurations are experimented and developed. Hodson and Marvin (2010) argue that some of the most powerful global cities such as New York, Tokyo or London are starting to engage more seriously with such experiments, but also that they require new and effective forms of intermediation that provide cities with the “capacity and capability to act” (p. 482). According to their assessment, intermediaries play essential roles in urban socio-technical transitions because they help negotiating between social

interests at different scales, allow to translate visions into social and material action and to coordinate the social and technical aspects of urban transitions. Another bridging role in socio-technical transitions mentioned by van Lente et al. (2003) is managing complex and long-term innovative projects. In light of the complex and long-term quality of urban infrastructures, we argue that this role is also potentially relevant in urban regeneration programmes. The bridging roles identified in the literature on socio-technical transitions are also included in Table 1 (R1-R5, R7, R8, R10-12). Note that due to the overlap between the literatures on SES and transition theory, most of the hypothesised bridging roles appear in both fields.

3. Research approach

The overall research objective of this article is to investigate whether the importance of bridging roles that has been identified in the wider sustainability literature – especially in social-ecological system theory and transition theory reviewed above – also applies to the specific case of urban regeneration programmes. Based on the experience of Brussels over the last 20 years, we study the roles of BOs in urban regeneration through three complementary methodological angles. In this section we present the corresponding research questions and empirical approaches for each of these three angles.

3.1 Can the roles for BOs be observed in urban regeneration programmes?

Our first empirical angle is analogue to Kivimaa's (2014) approach to the role of intermediaries in energy transitions in Finland, i.e. we start with the roles identified in the extant literature (as summarised in Table 1) and ask to what extent these roles have been performed by BOs in Brussels' urban regeneration programme since 1994. To do so, we draw on 23 semi-structured interviews that we carried out between 2013 and 2015.² While we do not claim that our sample is statistically representative of all stakeholders involved in the NC programme, we have selected the interviewees so as to cover 1) different levels of governance (i.e. local, municipal and regional); 2) different types of actors (residents, real estate owners, NGOs, planning companies, civil servants, politicians); 3)

² See data appendix I for the list of interviewees.

different stages of the programme; and 4) different age and gender groups. Moreover, between 2013 and 2016 we participated in more than 10 public and internal meetings related to NC programmes in neighbourhoods, notably the Neighbourhood Commissions in which elements of the local programme are presented and discussed with the general public.

3.2 To what extent have bridging roles led to successful cooperation in urban regeneration programmes?

The qualitative information based on interviews allows to assess whether certain organizations are perceived to perform bridging roles in urban regeneration. However, they are arguably less appropriate to measure whether these bridging roles have indeed led to successful cooperation. To address this issue, we adopt a second methodological angle and use quantitative data on urban regeneration in Brussels and provide objective evidence on the question to what extent bridging roles have been successful in leading to the outcome of collaboration. We are the first to exploit an exhaustive administrative dataset on all 1,933 urban renovation operations carried out under the NC programme since 1994. The data has been collected and provided to us by the Directorate for Urban Renovation (DUR), the agency in charge of overseeing the programme for the regional government. All municipalities directly report programme statistics to the DUR through standardised procedures.³ Methodologically, our results are based on econometric regression analysis applied to two quantitative indicators. The first indicator measures to what extent the implementation of urban renovation programmes in Brussels is characterised by coordination across different levels of governance. The second indicator can be interpreted as a measure of the extent to which the implemented programmes have bridged the potential divide between social and technical dimensions of urban renovation (Section 4.3).

3.3 How can bridging in urban regeneration programmes be improved?

³ For a detailed description of the database, see Kampelmann et al (2015).

Our third methodological angle confronts the two preceding ones with hands-on experiences that we gleaned by engaging in action research between 2013 and 2016. Robson (2002) defines action research as involving “action (solving concrete problems in real situations) and research (trying to further the goals of science)”. This implies intense cooperation between researchers and their subject matter through experiments or pilot projects that facilitate the direct engagement with problem solving. Especially in the context of urban regeneration, academic involvement in place-based partnerships for co-creating sustainability transitions is increasingly seen as both a means for fostering the social relevance of scientific work and the sustainability of urban forms (Trencher et al. 2013).

In this third methodological angle, our research strategy boils down to performing ourselves the role of a BO in order to investigate how bridging roles in the NC urban regeneration programme can be made more successful. A particularity of action research is that the research problems are co-framed with other stakeholders and that potential solutions to these problems are co-created as events unfold. While this set-up has the disadvantage of sacrificing ex ante control over the research protocol, it has the advantage of allowing to gain first-hand experience about the research problem and increases the scope for creativity and active problem solving (Loorbach et al, 2011). In Section 4.4, we describe our experiences from action research in which one of the authors acted as project manager in NC projects run by the Urban Ecology Centre Brussels (UEC).⁴ The UEC is a non-profit environmental organisation with close links to different academic institutions, but also to grass-roots organisations and local/regional administrations; it notably runs urban gardening projects in different neighbourhoods of Brussels.

4. Empirical results

In this section we describe the context and main features of the NC programme in Brussels (Section 4.1) and the empirical results for each of the three methodological angles presented in the previous section (Section 4.2-4.4).

⁴ www.urban-ecology.be

4.1 *Overview of Brussels' urban renovation programme*

The main urban renovation policy in Brussels is called 'Neighbourhood Contracts' (NCs)⁵. The legislative basis of the NC came into force in 1993 as one of the first major policies of the Brussels-Capital Region, a new territorial entity that was institutionalised in 1989. The first wave of NCs started in 1994, the second and third generations in 1997 and 1999. Since then, a new wave of NCs starts every year. Although the regulation and implementation of the NC programme has somewhat evolved over the last twenty years, the policy is characterised by remarkable stability.

The NC programme is in part a response to a long history of large-scale projects that left visible scars in the urban tissue of inner-city neighbourhoods: the tunnelling of the Senne river, the construction of the port, the railway junction between South and North stations, the construction of the metro... each of these projects came with its share of uncertainties, expropriations, demolitions and large construction sites that lasted for years, sometimes even for decades (Demey, 1990; Lenel, 2013). They also exacerbated the two historical trends of Brussels' urbanization since the mid-19th century, namely a) a centrifugal movement of middle- and upper-class households from the centre to the periphery and b) the contrast between the relatively poor working-class population in the canal area and the former wetlands of the Western Senne valley (the "poor crescent") and the bourgeoisie in the South-East.

Starting in the 1970s, regional structural change further accentuated the bipolarity of the city-region: the manufacturing industries in the canal area, traditionally the main employers of workers, declined. Having reached its maximum capacity in the mid-1970s, the port lost much of its importance as the city's transportation hub. Like other service-oriented urban economies, Brussels is witnessing an influx of young professionals who prefer living in inner-city neighbourhoods to commuting to peripheral suburbs. This development has, however, not yet erased Brussels' historical dichotomies: Figure 1 shows the distribution of average income in tax declarations in 2012 for different neighbourhoods and illustrates that outer neighbourhoods still tend to be richer than more central ones.

⁵ In terms of budget, scope and duration the NCs are by far the most important urban regeneration policy in Brussels over the period studied in this article. Other urban regeneration policies include the federal BELIRIS fund that invests in specific projects that are situated in Brussels but of national importance due to the status of the city as Belgian and European capital. Other urban regeneration policies with limited scope exist at the municipal level.

Relatively poorer neighbourhoods (including areas in Molenbeek and Schaerbeek who received international attention in the context of the terrorist attacks in Paris in 2015 and in Brussels in 2016) are concentrated in the canal area.

In order to target the neighbourhoods most in need of revitalisation, the regional authorities used a series of socio-economic criteria to define a priority zone from which each year neighbourhoods are selected for a local NC. This zone was defined in two Regional Development Plans in 1995 and 2002 (Figure 2a) and subsequently enlarged in the Regional Sustainable Development Plan in 2013 (Figure 2b). The priority zone covers neighbourhoods situated in 12 of the 19 municipalities that are part of the Bruxelles-Capital Region and, with some exceptions, roughly coincides with the area in the vicinity of the canal.

The NC is formally an investment contract between the region and a municipality, but also involves other actors at different levels of governance, including federal (notably the BELIRIS investment fund⁶), regional (regional ministries and administrations, regional NGOs) and local actors (different municipal services, local communities, local NGOs, individuals). The multiple levels of governance are depicted in Figure 3, which also illustrates that both bottom-up and top-down approaches can be associated with the same level of governance: the direction given to urban renovation policy by municipal actors can point to the top when it interacts with regional or federal interlocutors or to the bottom when it is concerned with local communities in individual neighbourhoods.

The total duration of a local NC spans around 7 years, a relatively short period of time to carry out some of the more complex operations.⁷ By the end of 2014, a total of 75 neighbourhood contracts have been signed between the regional and local administrations. The cumulated investment for all NCs that started in the last 20 years was 1.14 billion euros⁸, yielding an average of 15.14 million euros per neighbourhood.

⁶ See previous footnote.

⁷ A detailed description of the lifecycle of a local NC programme can be found in CREAT/METICES-CRU (2008).

⁸ All monetary amounts in this article are deflated and expressed in 2013 euros.

The funds were spent on 1,933 different operations so that each NC combines on average 26 individual operations in different spending categories. Over the period 1994-2014, the authors' calculations based on the database presented in Section 3.2 suggest that supply and quality of housing was the biggest spending category (39%), followed by social cohesion and public facilities (28%), amenities and infrastructure (26%) and local economy (5%). The management of the programme accounted for 3% of the total budget.⁹ Total annual investments in the NC programme fluctuated around 50 million euros during the first ten years and then increased to around 70 million euros over the last ten years. In the 1990s spending was concentrated on the renovation and construction of housing, but the share of this category decreased over time as investments in cohesion/facilities increased.

Finally, an important feature of the NC programme is that it invests not only in tangible operations that modify the physical environment of neighbourhoods, but also in projects directed mainly at people, such as training activities, awareness raising, cultural or artistic projects, neighbourhood cohesion etc, which was the case for around 47% of all operations (including project management). However, the average tangible operation was more than four times as expensive as the average people-oriented operation so that 84.5% of the total budget was spent on physical modifications, while only 12.8% were people-oriented investments other than project management. After a strong increase from 6% in 1994 to 18% in 2005, the share of these investments oscillated around 17% over the last ten years.

4.2 Qualitative evidence on bridging roles

In this section we use the qualitative material collected through interviews and the observation of meetings (see Section 3.1) to assess to what extent the different bridging roles identified in the sustainability literature also apply to the case of urban regeneration. We first discuss the perceptions of our interviewees on whether certain bridging roles are performed in the NC programme (Section 4.2.1) and if these roles have led to the desired outcome of interorganisational collaboration across scales, types of actors and sectors (Section 4.2.2).

⁹ For a detailed description of the definition and content of the different spending categories, see Kampelmann et al (2015).

4.2.1 Bridging roles

In the case of Brussels' urban renovation programme, our interviews suggest that bridging roles are mostly performed by the team around the local project manager ("*projectleider*"). For each local NC programme, the responsible municipality hires a project manager, normally on a four-year contract that is entirely financed by the NC budget. In the 1990s, this role was often shared among two municipal employees. But in order to clarify responsibilities, since 2002 the regional regulation stipulates the appointment of a single project manager. In practice, however, the project manager is still supported by one or several subordinates in charge of specific elements of the programme (e.g. a 'coordinator of socio-economic actions'). The project managers and their teams therefore form the most important BOs in the NC programme.

Through our interviews with project managers and local/regional stakeholders with whom they closely interact, we are able to analyse in more detail if the project managers and their teams performed the different bridging roles summarised in Table 1. Most interviewees spontaneously mentioned one or several bridging roles performed by NC project managers and their teams. Bridging activities between expectations, visions and interests of local and regional administrations (R1, R2, R3 and R4) are an integral part of the job description of each the project managers and their teams: they represent the institutional link and main intermediary between the interests of their employer (i.e. a municipality) and the principal source of funding of their employment (i.e. the region). Each project manager interacts on a day-to-day basis with regional administrators of the DUR, often more so than with other municipal departments. Their engagement in multi-level bridging is facilitated by the fact that they are often relatively detached from the departmental structure of municipal administrations, while they are at the same time institutionally anchored as municipal personnel. Also their temporary employment contract reinforces their status as being simultaneously "*insiders*" and "*outsiders*" with respect to their municipal colleagues.

None of the project managers we interviewed or who were described to us by others had a political profile. In the event of politically motivated clashes between municipal and regional decision makers, this means that they can act as neutral facilitators who "*want the project to get done*". As a

consequence, they are often the driving force for establishing a common vision among the local and regional levels of administration (R1). One of the ways of doing so this is through focusing on consensual programmes (R2). In many cases, this appears to have tilted investments towards social cohesion and public infrastructure projects: by investing in public facilities the region can claim to address the apparent shortage of daycare facilities and schools, whereas local policy makers can claim to improve the quality of life of the incumbent population rather than attracting new rich (poor) residents that could gentrify (stigmatize) the neighbourhoods. The fact that regions and municipalities have engaged in many NCs over time has clearly facilitated the coproduction and exchange of knowledge (R5) as stakeholders at different scales have gained experience and a better understanding of the negotiation procedure. Part of the work of the BOs is explicitly directed at learning from the experiences in other neighbourhoods, for instance when project managers visit other NCs or engage in conversations with other project managers in special events organised at regional level (R7).

Moreover, the BOs in Brussels' urban regeneration programme are found to engage in bridging roles between different types of stakeholders. Again, their status as temporary agents and insiders/outsideers of the municipality appears to help them in bridging diverging perspectives and interests of local community-based organisations and the public administrations in charge of the programme (R1-R4).

One of the ways in which project managers mediate between the administrative and grass-roots concerns seems to be to "make do" with the activities of the NGOs that happen to be in the neighbourhood. This supply-driven process has arguably led to a diversification of people-oriented projects as local NGOs cater to very different interests and operate in a range of sectors (youth, sports, culture, art, religion, environment etc). The roles of trust building and conflict resolution (R8 and R9) played by the BOs appear to have been facilitated by other features of the governance framework, such as the Neighbourhood Commissions that have been systematically improved and extended over time.

Project managers also engage in bridging between different dimensions of urban renovation (R6, R11, R12), notably between physical and people-oriented operations. This is also fostered by the fact that they are relatively detached from more sectorally organised municipal departments and that they are one of the few actors following up on all aspects of both physical and people-oriented operations

(R10, R11, R12). Some project managers have indeed managed to identify local organisations that work on the same issues that are addressed by physical interventions (e.g. water in the public space), and set up programmes that combine “bricks” operations (such as a new fountain) with “people” interventions (such as educational workshops on the role of water in urban contexts). Compared to the other bridging roles, however, our interviewees related relatively few instances of bridging between the biophysical and cultural aspects of neighbourhood renovation (R6). For instance, only few programmes appear to combine closely social and technical investments (R11).

4.2.2 Outcomes of bridging activities

In all interviews we encountered descriptions of conflictual relationships between the different elements of the NC programme. This casts doubts on whether the *perceived engagement* of project managers and their teams in bridging roles has actually led to the *outcome* of successful interorganisational collaboration across scales, types of actors and sectors.

Firstly, it is unclear to what extent BOs have successfully managed to overcome the conflictual relationship between the municipal and the regional governments/administrations (R2, R3, R4, R8 and R9). Although each local NC is formally a contract between the two levels of governance, it is a contract between parties with unequal power and potentially diverging interests. Both municipal and regional interviewees mentioned regular clashes, heated discussions and walkouts. In many cases such conflicts are underpinned by political differences: administrations ultimately report to politicians who are affiliated to political parties. On issues such as the choice between a public or private operator for a specific intervention, different political visions can obstruct cooperation. The underlying importance of party politics frequently resurfaces when elections change the majority in either municipal or regional governments, which can lead to a revision of a previously negotiated urban renovation programme.

Although the region has always “*the final word*” in each NC, it cannot impose the implementation of any specific operation without the complicity of the municipality in charge of the neighbourhood. A regional administrator framed this problem as “*a divergence of visions*” and gave a series of

examples. For instance, some municipalities do not want to increase the stock of social housing and prefer to attract richer residents through prestigious real estate projects. This contradicts the regional priority of creating more social housing through the NC programme. The municipal and regional visions for urban revitalisation can also clash in the case of physical projects. A local programme manager told us that regional socioeconomic objectives tend to focus on policy priorities such as employment creation and youth unemployment. While these issues are also on the agenda of municipalities, the latter often prefer to focus on more palpable and immediate concerns. A programme manager described the divergence of visions in this way: *“As a neighbour one could think ‘Yes, OK, there should be more jobs for young people but I am here to talk about the neighbourhood’. We are at a different scale here.”* In other words, issues such as youth unemployment are often perceived as pandemic/regional problems by municipal actors, whereas from a regional perspective local interventions in many neighbourhoods appear as a solution to these problems. As a consequence, BOs appear to have difficulties in effectively identifying common visions (R2) and translating common visions into social and material action (R10). One interviewee remarked that bridging role related to social learning (R7) are sometimes difficult to perform due to the relatively high turnover among project managers because of the fixed-term contracts in the BOs and the problems with the transmission of information, skills and experience that this turn-over engenders.

A second area in which the bridging activities appear to have at least partially failed to generate interorganisational collaboration arises from the complex relationship between grass-roots initiatives and public administrations. Many grass-root or community-based organisations participate in the NC programme, either through their presence in public meetings or by receiving subsidies for the implementation of bottom-up projects. But despite the efforts of BOs in arbitrating between these two types of actors (R8) or resolving the underlying conflicts (R9), some grass-root organisations have repeatedly criticized the predominant role of public administrations. These activists argue that massive investments in the physical environment lead to the gentrification of working-class neighbourhoods and that bottom-up projects are often instrumentalised to legitimize these investments in the eyes of the local population. In meetings with representatives of the regional federation of neighbourhood

committees, our interlocutors said that the NC policy has a “very bad reputation” among grass-roots organisations: while some of the investments formally resembled bottom-up initiatives, they were seen as instrumentalising local actors to serve external, top-down interests.

Finally, a third conflict stems from an apparent disconnection between the bottom-up and top-down elements of the policy, suggesting a failure of bridging activities directed at coordinating socio-technical transition across different sectors (R6 and R11). The interviewees coherently observed that bottom-up investments that involve local communities in the set-up and implementation mainly focus on people, whereas investments targeting the physical environment are typically piloted from the top by municipal or regional authorities. The policy hence approaches bricks and people in completely separate, disconnected ways. One symptom of this issue is the *institutional disconnection* of the two types of interventions. From a very early stage of a local NC programme, the interventions are split into physical and people-oriented elements that are subsequently implemented by different actors that only rarely cooperate with each other. The contractors implementing the physical interventions and the community-based organisations running the people-focused projects seldom meet and almost never work together. We also identified a *cognitive disconnection* between the two approaches. Actors we observed made a strict separation between physical and people-oriented projects in their neighbourhood and only rarely made spontaneous connections between them. Tangible investments are mostly referred to as “bricks projects”, whereas the people-oriented operations are “socioeconomic projects” or simply “the NGOs”. In meetings with representatives of local communities, the cognitive disconnection translates into the opposition between “them” and “us”, where the former refers to the operators involved in physical transformations and the latter to socioeconomic projects targeting people.

Overall, the qualitative evidence suggests that in the case of Brussels’ urban regeneration programme BOs appear to have performed all bridging roles identified in the sustainability literature. The extent to which the different roles are mentioned by in the interviews differs: bridging across actors and scales (e.g. R1, R2, R3, R4) was more frequently mentioned than bridging across natural/cultural or social/technical divides (R6, R11). At the same time, our qualitative material casts a doubt on whether

the bridging roles have actually been successful in achieving the desired outcomes. This holds to some extent for collaborations across scales and types of actors – bridging roles R2, R8 and R9 appear to have been less successful – but especially for bridging roles R6 and R11 that are related to collaborations between physical and people-oriented investments.

4.3 Quantitative evidence on outcomes of bridging activities

In this section we use our access to a quantitative database on the NC programme in order to provide a complementary angle on the question of whether the bridging activities have actually led to the desired outcome of interorganisational collaboration.

In the context of urban regeneration, we argue that important aspects of successful interorganisational collaboration can be operationalised by measuring 1) the degree to which different levels of governance influence investment decisions and 2) the degree to which tangible (i.e. physical) and intangible (i.e. people-oriented) projects are coordinated within local NCs. In the remainder of this section, we present quantitative evidence on these two outcome measures for the case of Brussels' urban regeneration programme.

4.3.1 Bridging across levels of governance

If the bridging roles discussed in Section 4.2 were successful in generating interorganisational collaboration across different levels of governance (e.g. R1, R3, R5), we would expect that both regional and municipal authorities have discretionary power over how urban regeneration investments are spent across different types of investments. If only one of the two levels of governance can decide unilaterally on which types of projects the investments are spent, this can be seen as evidence against close collaboration between the two levels. Conversely, if both regional and municipal authorities are able to influence how the investments are spent, we cannot reject the hypothesis of successful bridging and interorganisational cooperation across levels of governance.

One way to operationalise this indicator is to look at the variation in budget allocations across different municipalities; low variations between municipalities can be interpreted as evidence for unilateral

spending decisions by regional authorities, whereas high variations between municipalities suggest that the latter can also influence spending decisions. We have measured this variation in all 75 local NC programmes through a simple regression framework with spending shares on each investment category as dependent variables and the 19 municipalities as independent variables. If municipalities (the region) exert stronger influence on the spending shares, then we would expect relatively high (low) coefficients of determination.

As can be seen in Table 2, the explanatory power of municipalities is weak for amenities and cohesion and the supply of housing (the municipality variables account for less than 10% of the variation in budget allocations) and somewhat higher for local economy and quality of housing (18 and 16%, respectively). In a second step, we have added time variables to the regression; results suggest that the time trend is more strongly correlated with the budget allocation for amenities and infrastructure, cohesion and facilities and supply of social housing (second column in Table 2). Including time variables in the regression yields coefficients of determination between 15 and 50%.

4.3.2 Bridging across social and technical transitions

The bridging roles R6 and R11 are explicitly related to the connection between the cultural/social aspects of urban regeneration, on the one hand, and the biophysical/technical aspects on the other hand. Our second measure of bridging outcomes provides first quantitative evidence on whether these two areas have effectively been coordinated in Brussels' NC programme.

We operationalised this measure by calculating the distribution of budgets in each NC programme across different investment categories. If programmes that invested more money in intangible projects in a specific spending category (e.g. local economy) are also those that invested more in tangible projects in this category, this can be interpreted as evidence that the tangible and intangible projects have been coordinated and that bridging roles R6 and R11 have been more successful. Conversely, a weak correlation between tangible and intangible investments in the same spending category can be interpreted as evidence against successful bridging.

Table 3 presents results for Ordinary Least Squares regressions on investment shares in all 75 local programmes. The dependent variables are the shares of intangible investments in each investment category; the shares of tangible investments for the same category are the main independent variables. The estimated coefficients suggest insignificant correlations, except for the supply of housing where the coefficient is very small.¹⁰

4.4 Action research to improve the success of bridging roles

The third set of empirical results comes out of the action research. We experimented with new ways of performing bridging roles in Brussels' urban regeneration programme and used the Urban Ecology Centre Brussels (UEC) as BO in order to perform ourselves the role of project managers in four different NC programmes respectively called 'Bockstael', 'Bloemenhof', 'Abbaye' and 'Zinneke'. In all four neighbourhoods, the involvement of the UEC resulted from informal discussions with the respective municipality about on-going NC programmes that led to a formal project proposition of the UEC for the neighbourhood. Two of these projects were funded by the NC and the other two by the regional environmental agency. We have selected these projects for action research because all of them are provided scope for bridging roles in the NC programme.

During the first phase of action research, we framed the underlying bridging problem together with the other stakeholders in each project (including the regional and municipal authorities, but also representatives of the local communities such as neighbours and real estate owners and NGOs). This helped to articulate the main bridging challenges in each local situation. The first type of bridging challenge we identified is related to tensions between multiple levels of governance and arises from confrontations between top-down regional planning and bottom-up local adaptation involving one or several issues such as mobility (Bockstael, Bloemenhof), housing (Bloemenhof, Zinneke), green spaces (Bockstael, Bloemenhof, Abbaye), water (Abbaye) and the economy (Zinneke). A second bridging challenge is related to tensions between multiple types of actors that intervene in each neighbourhood such as regional administrations and local residents or NGOs. We observed that the

¹⁰ This conclusion is robust to dropping local programmes from the sample with zero investment shares for certain categories.

municipalities in charge of the NC acted as BOs in all four projects in which we were involved. Finally, a third type of bridging challenge we identified in all four projects is related to the multidimensionality of urban renovation situation and a consequence of the potential incoherence between investments directed at the physical environment (modification of grey, blue or green infrastructures) and intangible interventions (activation, organisation, participation of concepts or people).

In a second stage, we tried to understand in more detail why these bridging challenges are difficult to overcome. Our observations on this question can be summarised in the form of two recurring obstacles: asynchronicity and the lack of a shared language across different elements of the urban renovation projects. Perhaps surprisingly, we observed no case in which actions with different scales, actors or dimensions are completely inconsistent and per se conflictual.

Finally, in a third stage we experimented with bridging activities in each of the four neighbourhoods that were designed to overcome asynchronicity and the lack of a shared language. In the remainder of this section we briefly present these experimental solutions.

4.4.1 Bridging to address asynchronicity

Asynchronicity can stem from the timing of interventions at different scales and carried out by different actors. Moulaert et al (2005) refer to this issue as “the conflict of temporalities between agencies” that arise notably between the political world, the economy and civil society movements. They argue that this conflict “may seriously disturb the reproduction of socially innovative initiatives” and recommend “to analyse the factors of these differences and how they can be oriented towards a better time-convergence” (p. 1989).

In three of the four projects the regional interventions were still in a planning phase and no physical interventions were expected to materialize before 2017. The precise starting dates of the implementation of the mobility circle (Bockstael) and the roll-on roll-off infrastructure (Zinneke) lie even further in the future. Moreover, each type of actor works according to its own rhythm: while the regional administrations planned several years ahead and were slow to react to new developments,

local actors tended to focus on rapid action and immediate change. Finally, the lifecycle of a project involving the adaptation of the physical environment is typically much longer compared to actions directed at people. Each of these conflicts of temporalities renders the coordination of visions, agendas and actions extremely complex and creates considerable uncertainty as to their mutual fit. A frequent risk is that bottom-up initiatives are put on stand-by or taper out as local actors do not have the capacity to follow up on the protracted procedures of top-down projects. This is arguably one of the reasons why the NC programme managers are wary of linking top-down and bottom-up projects in order to avoid the interdependencies that would make both types of projects riskier – and why bridging across scales and dimensions appears to have been relatively unsuccessful according to the empirical evidence presented in Sections 4.1 and 4.2.

A potential solution to the conflict of temporalities that we experimented with in our action research is to modify the lifecycle of bottom-up projects by presenting them as “potentially temporary interventions”. This is similar to Cox et al’s (2014) conclusion that conflicts of temporalities can often be attenuated through “temporary constructions or occupations of spaces” as a means “to stimulate the local community to assess their environment more critically or to see previously unnoticed potentialities and qualities” (p. 24). We experienced this as a way of maintaining the momentum in bottom-up initiatives that thrive on the motivating factor of rapid transformation without committing decision makers at other scales of governance to definite arrangements that could be potentially incompatible with “longer term systemic programmes” for urban transitions (Hodson and Marvin, 2010). The adverb “*potentially*” is not trivial because many projects ultimately turn out to be compatible with long-term developments but would probably not have seen the light of day if they had been conceived of as permanent interventions from the outset.¹¹

4.4.2 Bridging to address the lack of shared language

The second major bridging challenge we were confronted with consists in the translation of narratives across scales, actors or dimensions. For instance, it was challenging to translate a relatively abstract

¹¹ Two well-known examples of rather enduring temporary interventions in cities are Paris’ Eiffel Tower (1889) and Brussels’ Atomium (1958).

discourse on watershed solidarity into meaningful concepts at the level of an individual house, as was done in the NC Abbaye. A similar difficulty also arose in the Bloemenhof neighbourhood where the implications of a top-down masterplan spanning several hectares had to be translated into a narrative at the scale of a relatively small square. When such translations involve different scales of urban planning, we experienced the NC project managers to be effective translators, arguably because most of them have a professional background in architecture or urbanism. But they are arguably less equipped to translate across scales, actors or dimensions when it comes to social or economic issues on which they have less knowledge. This is directly related to Hodson and Marvin's (2010) recommendation that successful intermediaries in urban transitions need to "think carefully about how they represent what they do to the variety of different partners they build relationships with. This is important in communicating credibility and building trust with a variety of partners" (p. 483). The competences required for translation differ according to the project at hand and encompassed urbanism and planning competences (Bloemenhof, Bockstael), hydrology (Abbaye) and urban economics (Zinneke). While we believe that this has helped to translate narratives across scales and actors, we found it to be considerably more difficult to translate across different dimensions of urban renovation projects, which arguably adds to the difficulties of BOs to build bridges between investments directed at the physical environment and those directed at people. In projects where it was possible to translate across scales and types of knowledge, this led to a more effective articulation of the interests of all involved actors, which can be a precondition of successful negotiation and constructive communication.

5. Discussion

In this section we discuss our empirical findings and relate them to the literature on social-ecological systems and transition theory.

5.1 Bridging in urban regeneration happens, but with mitigated success

Our qualitative evidence based on a major on-going urban regeneration policy in Brussels suggests that the local project managers and their teams functioned as bridging organisations (Section 4.2.1). More specifically, they are associated with a series of bridging roles that we extracted from the literature on social-ecological systems and transition theory (Table 1). The BOs in our sample are perceived to be particularly engaged with bridging across different types of actors and interests (R1, R2, R3, R4). Conversely, our interviewees related relatively few instances of bridging between the biophysical and social aspects of neighbourhood renovation (R6) and only few BOs appear to try coordinating social and technical investments (R11). This result clearly implies that it is important to distinguish carefully between different bridging roles, as not all of them appear to be carried out with the same intensity.

While our findings suggest that certain bridging activities indeed occur in urban regeneration programmes, our qualitative evidence also attested conflictual relationships between the different elements of NC programmes (Section 4.2.2). This casts doubts on whether the *perceived engagement* of project managers and their teams in bridging roles has actually led to the *outcome* of successful interorganisational collaboration in urban transitions.

These doubts cannot be rejected on the basis of complementary quantitative material on Brussels' urban regeneration programme (Section 4.3). We operationalized successful bridging outcomes through indicators measuring 1) the degree to which different levels of governance influence investment decisions and 2) the degree to which tangible and intangible projects are coordinated within local NCs. Regarding the first indicator, we interpret our econometric results as preliminary evidence that the allocation of funding among different spending categories is relatively top-down and/or driven by a regional trend, except for investments related to the local economy and the quality of housing for which a relatively larger share of the variation is associated to the different local municipalities. This suggests that interorganisational collaboration between the municipal and regional levels of governance has not been very strong when it comes to deciding how to spend the investments across different spending categories. As for the second indicator, we interpret our quantitative results as evidence that the tangible and intangible elements of the urban renovation investments are relatively disconnected, suggesting that bridging roles R6 (intermediating between natural and cultural spheres

of causation) and R11 (coordinating urban socio-technical transition) have not been successful. Overall, both the qualitative and quantitative data on bridging roles in Brussels' urban regeneration programme can be interpreted as evidence that several bridging activities (especially R1, R3, R6 and R11) have encountered only mitigated success.

We think that this is a relevant result whose implications are not only limited to urban regeneration, but also to the wider literatures on BOs and related concepts, such as intermediaries or boundary organisations. While extant research on intermediation in sustainability transitions has focused on distinguishing between potential roles and assessed their incidence in the behaviour of empirical organisations (Kivimaa 2014, Dedeurwaerdere et al 2015), our evidence implies that the perceived engagement in bridging roles may be a necessary but not a sufficient condition for successful bridging outcomes. Our results also imply that it is relevant to investigate *why* bridging activities can fail in bringing about interorganisational collaboration and invite researchers to analyse in more detail the obstacles and challenges for successful bridging. The next section contributes first answers to this question for the case of urban regeneration programmes.

Our research further suggests that the different bridging roles identified in Table 1 are related to three broad categories of bridging challenges in the context of urban regeneration. These challenges respectively concern tensions 1) between different scales of governance, 2) between heterogeneous types of actors and 3) between multiple dimensions of urban sustainability transitions. Table 4 provides an example for each of these bridging challenges and shows how they relate to general features of urban regeneration. We interpret our evidence as indicating that the observed bridging activities between multiple levels of governance and between different types of actors could have exacerbated the disconnection between multiple dimensions of urban regeneration. Indeed, disconnecting the different dimensions of urban renovation might have helped the project managers to find consensus on tangible projects between different levels of administration, while also allowing to cater to grass-roots concerns. In many programmes the BOs have attenuated conflicts between different levels of public administrations by building a consensus on physical investments, whereas they mediated the tension between public administrations and community-based actors by

empowering the latter in investments directed at people. The combination of these two bridging strategies, however, appears to have exacerbated the apparent disconnection between urban renovation investments directed at the physical environment and those targeting people.

5.2 Discussion of empirical results in light of the sustainability literature

As stated in Section 2.2.1, SES theory is based on the premise of complexity in systems combining society and biophysical materialities. Hosting many of the biophysical structures of society, cities are situated at the intersection between these two spheres. According to the recent studies on urban SES we reviewed above, the complexity of these structures appears to be increasing. This further strengthens the need for actors able to navigate through systemic complexity. While SES theory has long recognised the potential of BOs for system transitions, our results suggest that we also need to think about the concept of bridging in systemic terms. More specifically, we argue that different types of bridging roles should not be analysed as separate activities that can be added or distributed across different organisations, but as being interdependent on each other. In a way, the interdependence of bridging roles echoes the complexity of the urban SES to whose transition bridging organisations are supposed to contribute. For the case of urban regeneration, urban SES involve multiple scales, types of actors and dimensions that stand in complex relationships, and successful bridging also has to be ‘systemic’ by addressing these three challenges simultaneously.

One way to further our understanding of successful systemic bridging is by fostering the link between SES and the transition theories (Section 2.2.2). This link is facilitated by the fact that intentional strategies to bring about sustainability transitions, including transition management and strategic niche management, underline the importance of ‘systemic intermediaries’ (van Lente et al. 2003). Indeed, the different factors for successful systemic intermediaries identified by Hodson and Marvin (2010) and Kivimaa (2014) provide complementary explanations for the mitigated success of the BOs in the case of Brussels’ urban regeneration programme over the last 20 years. From the seven different success factors identified by Hodson and Marvin, the NC project managers and their teams clearly lack 1) organisational stability and longer term funding as all NC programmes are temporary

interventions and 2) credible financial and political neutrality because the NC project managers operate in political and administrative hierarchies on which they depend financially. The positive results of our experiments with action research (Section 4.4) are also in line with previous research on systemic intermediation given that one of the improvements of bridging roles consisted in a better alignment of multiple sets of social interests through communication and a differentiated communication about urban renovation projects that adapted language to different interlocutors. While the NGO we used for our action research cannot be characterised as financially independent (all four projects were financed by public authorities), its shared collective organisational culture and a credible embeddedness in the specific urban context of Brussels might help explaining the relative success of the two bridging strategies described in Section 4.4. By contrast, our finding that temporal projects can improve bridging across scales, actors and dimensions of urban renovation contradicts Hodson and Marvin's assessment that longer term programmes are essential for systemic intermediation and lends support to Kivimaa's argument that shorter interventions allow to avoid regime lock-in.

6. Conclusion

This article focused on the role of bridging organisations in urban regeneration programmes. While different strands of the literature underline the centrality of bridging roles in transitioning towards sustainability, our paper fills an important gap by being the first to examine empirically the incidence and success of bridging activities in the context of urban regeneration policies.

Based on the application of three complementary methodological angles on the role of bridging organisations in the case of a major urban regeneration policy in the city of Brussels, our study contributes to the knowledge on BOs by providing first evidence that 1) a series of bridging roles identified in the literature on sustainability are performed by BOs in the context of urban regeneration; 2) key bridging roles appear to encounter only mitigated success, especially as regards bridging between social and biophysical interventions in urban regeneration programmes; 3) unsuccessful outcomes of bridging activities could be related to a series of bridging challenges such as communication problems between actors at different scales, conflicts of temporalities between social

and biophysical projects, and the relative absence of political and financial neutrality of BOs; and 4) BOs engaged in urban regeneration might respond to these challenges in a way that disconnects social and biophysical aspects of investment programmes. In the case of the NC programme in Brussels, the combined result of these four factors seems to have led to a situation in which bridging between different scales, actors and dimensions of the urban system forms a trilemma rather than a trilogy: the observed bridging activities between multiple levels of governance and between different types of actors appear to have exacerbated the disconnection between multiple dimensions of urban regeneration. Such a disconnection, however, means that current forms of bridging need to be revised and improved to make them more ‘systematic’ in the sense of a tighter coordination between transitions of social and biophysical spheres of urban SES.

Further research in this field could follow the approach adopted in this article and combine the SES research on urban complexity with insights from transition research on roles and success factors of systemic intermediaries, for instance by testing the external validity of our findings for the case of other cities undergoing structural change.

Acknowledgements

This research is a result of the Transitioning Towards Urban Resilience and Sustainability (TURaS) project and has received funding from the European Union’s Seventh Programme for research, technological development and demonstration under grant agreement No 282834. We thank Adrian Vickery Hill for improving the figures. Two anonymous reviewers and participants of the seminar in Environmental Economics of the Solvay Brussels School of Economics and Management and the 11th International Conference of the European Society for Ecological Economics at the University of Leeds have provided helpful comments on an earlier version. Patrick Van den Abeele (Brussels Environment) provided extraordinary research assistance.

References

1. Berkes, F. (2009). Evolution of co-management: Role of knowledge generation, bridging organizations and social learning. *Journal of Environmental Management* 90, 1692–1702.
2. Berkes, F. and Folke, C. (Eds.) (1998). *Linking Social and Ecological Systems. Management Practices and Social Mechanisms for Building Resilience*, Cambridge University Press, Cambridge, pp. 1–26
3. Born, B., & Purcell, M. (2006). Avoiding the local trap scale and food systems in planning research. *Journal of Planning Education and Research*, 26(2), 195-207.
4. Brenner, N. 1999. Globalisation as reterritorialization: The re-scaling of urban governance in the European Union. *Urban Studies* 36 (3): 431–51.
5. Bulkeley, H., & Castán Broto, V. (2013). Government by experiment? Global cities and the governing of climate change. *Transactions of the Institute of British Geographers*, 38(3), 361-375.
6. Brown, D. (1991). Bridging Organizations and Sustainable Development. *Human Relations* August 1991 vol. 44 no. 8 807-831.
7. Brunner, R.D. (2010). Adaptive governance as a reform strategy. *Policy sciences*. 43, 301-341.
8. Busso, M., Gregory, J. and P. Kline (2013). "Assessing the Incidence and Efficiency of a Prominent Place Based Policy," *American Economic Review* 103(2), 897-947.
9. Candemir, B. H. Van Lente, (2007). *Intermediary organisations: bridges, catalyst, or noise? An analysis of Agricultural Biotechnology in the Netherlands*, Triple Helix 6 Conference, National University of Singapore, School of Engineering.
10. Cash, D. W., & Moser, S. C. (2000). Linking global and local scales: designing dynamic assessment and management processes. *Global environmental change*, 10(2), 109-120.
11. Clayton, N., Williams, M, and Howell, A. (2014). *Unequal Opportunity: How Jobs Are Changing in Cities*. London: Centre for Cities, 39p.
12. Couch, C., O. Sykes, W. Börstinghaus (2011). Thirty years of urban regeneration in Britain, Germany and France: The importance of context and path dependency, *Progress in Planning*, 75(1), 1–52.

13. Cowell, M. (2013). Bounce back or move on: Regional resilience and economic development planning. *Cities* 30, 212–222.
14. Cox, V., Goethals, M., De Meulder, B., Schreurs, J. and Moulaert, F. (2014). Beyond Design and Participation: The ‘Thought for Food’ Project in Flanders, Belgium, *Journal of Urban Design*, 19:4, 412-435.
15. CREAT/METICES-CRU (2008) *Evaluation quantitative et qualitative des programmes de revitalisation des quartiers : bilans des séries 1999, 2000 et 2001, août 2008*. Research report.
16. Dedeurwaerdere, T., Polard, A., & Melindi-Ghidi, P. (2015). The role of network bridging organisations in compensation payments for agri-environmental services under the EU Common Agricultural Policy. *Ecological Economics*, 119, 24-38.
17. Demey, T. (1990). *Bruxelles, chronique d'une capitale en chantier. Tome I. Du voûtement de la Senne à la jonction Nord-Midi*. Bruxelles: Paul Legrain, 342 p.
18. Duvigneaud P. et S. Denaeyer-De Smet (1975). “L’ecosysteme Urbs. L’ecosysteme urbain Bruxellois”, In P. Duvigneaud et P. Kestemont (Eds.), *Productivite biologique en Belgique*, 581-597, Gembloux: Editions Duculot
19. Fischer-Kowalski M., and Haberl. H., Socioecological Transitions and Global Change. Trajectories of Social Metabolism and Land Use. 2007, Vienna: Klagenfurt University.
20. Folke, C., Jansson, A., Larsson, J., Costanza, R., (1997). Ecosystem appropriation by cities. *Ambio* 26,167–172.
21. Folke, Carl., Thomas Hahn, Per Olsson, Jon Norberg (2005). "Adaptive Governance of Social-Ecological Systems." *Annual Review of Environmental Resources* 30: 411-73.
22. Geels, F. (2005). Co-evolution of technology and society: The transition in water supply and personal hygiene in the Netherlands (1850–1930)—a case study in multi-level perspective. *Technology in society*, 27(3), 363-397.
23. Gunderson, L. H, S. S. Light, and C. S. Holling. 1995. *Barriers and bridges to the renewal of regional ecosystems*. Columbia University Press, New York, New York, USA.

24. Haberl H., Fischer-Kowalski M., Krausmann F., Weisz H., and Winiwarter V., Progress towards sustainability? What the conceptual framework of material and energy flow accounting (MEFA) can offer, *Land Use Policy*, 2004, **21(3)**, 199-213.
25. Hargreaves T., Hielscher S., Seyfang G. and Smith A., Grassroots innovations in community energy: The role of intermediaries in niche development, *Global Environmental Change* **23** (5), 2013, 868-880.
26. Glaeser, Edward L., and Joshua D. Gottlieb (2008). "The Economics of Place-Making Policies." *Brookings Papers on Economic Activity*, 155–239.
27. Hahn, T., Olsson, P., Folke, C., and Johansson, K. (2006). Trust-building, knowledge generation and organizational innovations: the role of a bridging organization for adaptive co-management of a wetland landscape around Kristianstad, Sweden. *Human Ecology* 34:573–592.
28. Hill et al. (2012). Economic Shocks and Regional Economic Resilience. In: *Building Resilient Regions: Urban and Regional Policy and Its Effects*, vol. 4, edited by Nancy Pindus, Margaret Weir, Howard Wial, and Harold Wolman. Washington: Brookings Institution Press, 2012.
29. Hodson, M. and Marvin, S. (2010). "Can cities shape socio-technical transitions and how would we know if they were?" *Research policy*, 39(4), 477-485.
30. Kampelmann, S., Vanhollebeke, S. and Vandergert, P. (2015). The Governance of Economic Resilience: 20 Years of Urban Adaptation Projects in Brussels. *DULBEA Working Paper*, Research series, N°15-01.RS, February.
31. Kivimaa, P., Government-affiliated intermediary organisations as actors in system-level transitions, *Research Pol.* **43**, 2014, 1370-1380.
32. Klerkx L. and Leeuwis C., Establishment and embedding of innovation brokers at different innovation system levels: Insights from the Dutch agricultural sector. *Technological forecasting and social change*, **76** (6), 2009, 849-860.

33. Kohlbrenner A., De l'engrais au déchet, des campagnes à la rivière: une histoire de Bruxelles et de ses excréments. *Brussels Studies*, **78**, 2014, 1-13.
34. Kemp, R., Loorbach, D., & Rotmans, J. (2007). Transition management as a model for managing processes of co-evolution towards sustainable development. *The International Journal of Sustainable Development & World Ecology*, *14*(1), 78-91.
35. Krausmann, F., 2013. A city and its hinterland: Vienna's energy metabolism 1800–2006. In: Singh, S.J., et al. (Eds.), *Long Term Socio-ecological Research. Studies in Society Nature Interactions Across Spatial and Temporal Scales*. Springer Verlag GmbH, Berlin, Heidelberg, New York, pp. 247–268.
36. Le Corbusier, 1957 [1941], *La Charte d'Athènes*. Pais: Seuil, 190p.
37. Lenel, E. (2013), La mixité sociale dans l'action publique urbaine à Bruxelles. Projet ou langage politique ? *Brussels Studies*, Numéro 65, 25 février 2013.
38. Loorbach, D., N. Frantzeskaki, W. Thissen (2011). A transition research perspective on governance for sustainability, in: C. Jaeger, J. Tàbara, J. Jaeger (Eds.), *European Research on Sustainable Development, Transformative Science Approaches for Sustainability*, vol. 1 (2011), pp. 73–89.
39. Moulaert, F., Martinelli, F., Swyngedouw, E. and Gonzalez, S. (2005). Towards Alternative Model(s) of Local Innovation. *Urban Studies*, Vol. 42, No. 11, 1969–1990.
40. Nolan, A., and G. Wong (2004). Evaluating Local Economic and Employment Development: How to Assess What Works Among Programmes and Policies. Paris: Organization for Economic Cooperation and Development.
41. Ostrom, E. (2015). *Governing the commons*. Cambridge university press.
42. Perry, B., May, T., 2010. Urban knowledge exchange: devilish dichotomies and active intermediation. *International Journal of Knowledge-Based Development* 1, 6–24.
43. Pretty, J. (2003). Social Capital and The Collective Management of Resources. *Science* 302: 1912–1914.

44. Plummer, R. and D. Armitage (2007). A resilience-based framework for evaluating adaptive co-management: Linking ecology, economics and society in a complex world. *Ecological Economics* 61, 62-74.
45. Robson, C. (2002). *Real World Research: a Resource for Social Scientists and Practitioner-researchers*. Oxford: Blackwell.
46. Sapsed, J., A. Grantham, R. DeFillippi, A bridge over troubled waters: bridging organisations and entrepreneurial opportunities in emerging sectors, *Res. Policy* 36 (9) (2007) 1314–1334.
47. Swyngedouw, E. 1997. *Neither global nor local: “Glocalization” and the politics of scale*. In *Spaces of globalization*, edited by K. Cox, 137–166. New York: Guilford.
48. Trencher, G., M. Yarime, A. Kharrazi (2013) Special Issue: Advancing sustainable urban transformation, Co-creating sustainability: cross-sector university collaborations for driving sustainable urban transformations, *Journal of Cleaner Production*, Volume 50, Pages 40–55.
49. Westley, F. (1995). Governing design: the management of social systems and ecosystems management. *Barriers and bridges to the renewal of ecosystems and institutions*. Columbia University Press, New York, New York, USA, 391-427.
50. Weisz, H., Steinberger, J.K., 2010. Reducing energy and material flows in cities. *Curr. Opin. Environ. Sustain.* 2, 185–192.
51. Van Lente, H., M. Hekkert, R. Smits, B. Van Waveren, Roles of systemic intermediaries in transition processes, *Int. J. Innov. Manag.* 7 (3) (2003) 1–33.
52. Vignola, R., T. L. McDaniels and R. W. Scholz (2013). Governance structures for ecosystem-based adaptation: Using policy-network analysis to identify key organizations for bridging information across scales and policy areas. *Environmental science & policy* 31, 71–84.

Figure 1: Average income in tax declarations (in 2012 euros)

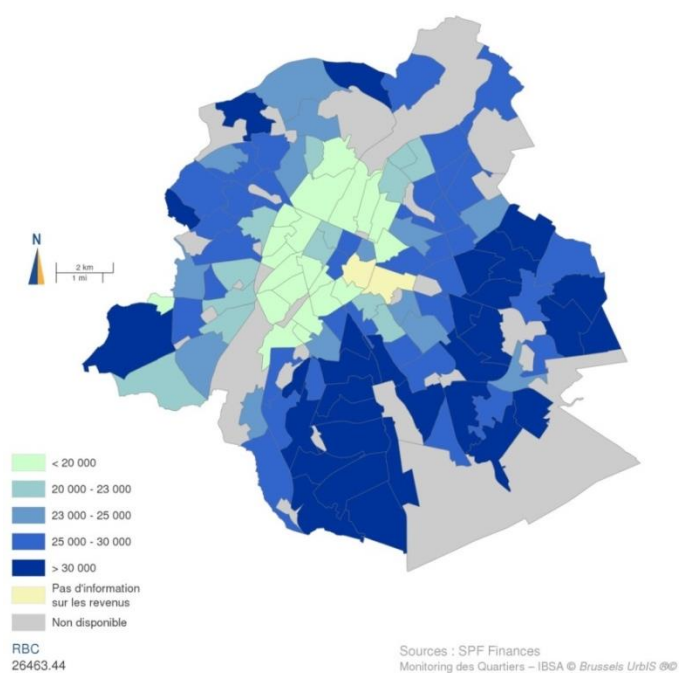
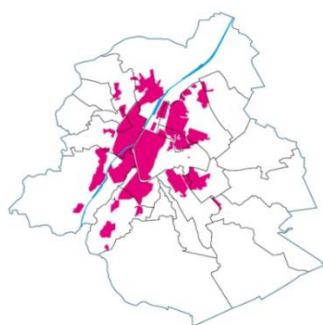


Figure 2: Priority zones in Brussels urban regeneration programme

a) 1994-2013



b) Since 2013



**Figure 3: Directions of top-down and bottom-up initiatives
in the Neighbourhood Contract Programme**

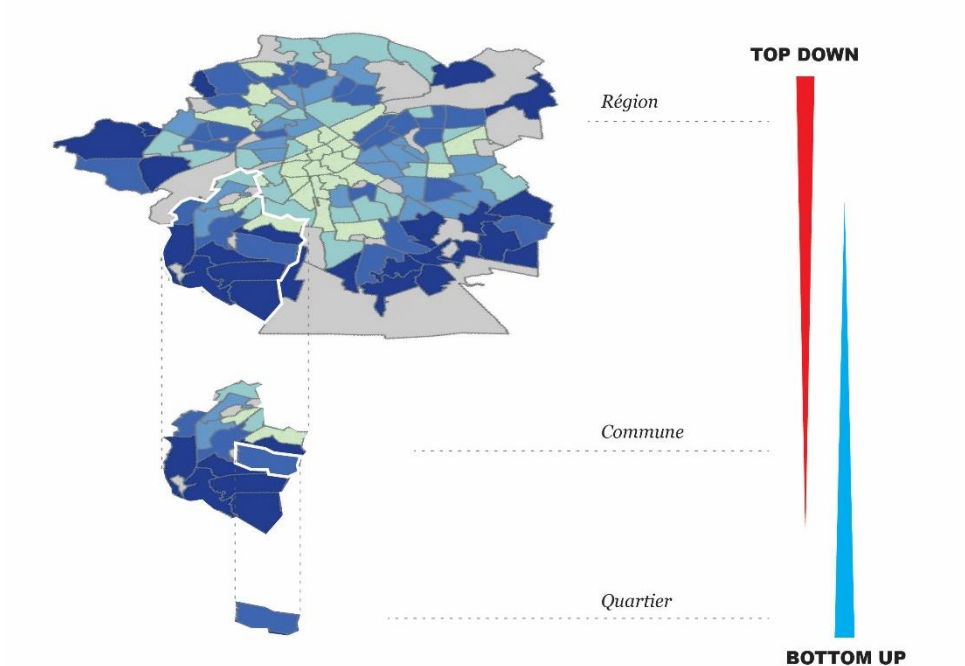


Table 1. Potential roles for BOs in urban regeneration programmes

	Potential roles	References in the sustainability literature
R1	Articulating expectations and visions of different stakeholders	Brown (1991), cf. Kivimaa (2014)
R2	Identifying common interests and social incentives for cooperation	Pretty (2003), van Lente et al. (2003), Folke et al. (2005), Hahn et al. (2006)
R3	Negotiating between social interests at different scales	Brown (1991), Hodson and Marvin (2010)
R4	Fostering interorganisational collaboration and building of social networks	Westley (1995), Folke et al. (2005), Hahn et al. (2006), cf. Kivimaa (2014)
R5	Facilitating the coproduction and exchange of knowledge amongst actors with different cognitive background frames or at different scales	Brown (1991), van Lente et al. (2003), Folke et al. (2005), Berkes (2009), Vignola et al. (2013), Dedeurwaerdere et al. (2015)
R6	Intermediating between natural (biophysical) and cultural (symbolic) spheres of causation	Fischer-Kowalski and Haberl (2007)
R7	Providing an arena for (social) learning	van Lente et al. (2003), Folke et al. (2005), Berkes (2009)
R8	Arbitrating and trust-building	Folke et al. (2005), Hahn et al (2006), Berkes (2009), cf. Kivimaa (2014)
R9	Facilitating conflict resolution	Folke et al. (2005), Berkes (2009)
R10	Translating visions into social and material action	Brown (1991), Hodson and Marvin (2010)
R11	Coordinating urban socio-technical transition	Hodson and Marvin (2010)
R12	Managing complex and long-term innovative projects	van Lente et al. (2003), cf. Kivimaa (2014)

Table 2. Regression results with investment shares as dependent variable

Dependent variable	Adjusted coefficient of determination		
	Only municipality variables	Only year variables	Municipality and year variables
Share of amenities & infrastructure	-0.0101	0.2735	0.2443
Share of local economy	0.1812	0.0665	0.1776
Share of cohesion & facilities	-0.0799	0.5408	0.5029
Share of supply of housing	0.0793	0.0933	0.1492
Share of quality of housing	0.1571	0.0897	0.3463

Note: Pooled Ordinary Least Squares estimator, N=75 programmes.

Table 3: Regression on link between tangible and intangible investment shares

Dependent variable: share of intangible investments	Amenities & infrastructure	Local economy	Cohesion & facilities	Supply of housing	Quality of housing
Share of tangible investments	0.06 (0.04)	-0.21 (0.20)	0.01 (0.05)	0.00* (0.00)	-0.03 (0.02)
Year variables	Yes	Yes	Yes	Yes	Yes
Municipal variables	Yes	Yes	Yes	Yes	Yes
Observations	75	75	75	75	75
Adjusted R2	0.12	-0.06	-0.03	0.08	0.34

Table 4: Features of urban regeneration and examples of related bridging challenges

<i>Features of urban regeneration</i>	<i>Example of bridging challenge</i>
<i>Multiple dimensions</i> are interconnected and potentially conflictual	Coordinating the reconversion of industrial buildings with the retraining of industrial workers
Actions at <i>multiple geographical scales</i> can be counterproductive or contradictory, requiring a multi-scalar approach	Finding synergies between objectives of bottom-up neighbourhood initiatives and top-down regional urban regeneration plans
<i>Multiple types of stakeholders</i> with potentially conflicting interests and perspectives	Defining urban renovation projects that benefit the local population, public authorities and the business community

Data appendix I

Type	Position	Date of interview
Municip. administration	Project manager	23.4.14
Municip. administration	Project manager	15.5.14
Municip. administration	Project manager	Several dates between 7.2014 and 1.2015
Municip. administration	Responsable actions vertes	Several dates between 7.2014 and 1.2015
Municip. administration	Responsable actions vertes	15.1.2015
Municip. administration	Project manager	Several dates between 1.2015 and 2.2015 2015
Municip. administration	Responsable projets socioéconomiques	Several dates between 1.2015 and 2.2015 2015
Municip. politics	Project manager	15.5.14
Real estate owner	Real estate owner	Several dates between 10. and 11.2014
Reg. administration	Directeur faisant fonction (en 2013-2014)	1.4.2014
Reg. administration	Director	6.9.2014
Reg. administration	Former director	24.1.2013
Reg. administration	Project manager	1.4.14
Reg. administration	Project coordinator, organises « Journées des Chefs de Projets »	28.1.2015
Reg. administration	Head of department	1.2.2013
Reg. NGO	Project coordinator	Several dates between 11.2014 and 12.2015
Reg. NGO	Board member	24.1.13
Reg. NGO	Project manager	27.10.15
Reg. politics	Responsable pour les Contrats de Quartiers Durables at the Cellule Rénovation urbaine	18.3.2014
Urbanist/architect	Partner	14.7.2014
Urbanist/architect	Project manager	Several dates between 1.2015 and 2.2015
Urbanist/architect	Partner	26.11.2015
Urbanist/architect	Partner	22.4.2015