Sustainable development and the concept of scale

Debarbieux, Bernard; Balsiger, Jörg

How to cite

DEBARBIEUX, Bernard, BALSIGER, Jörg. Sustainable development and the concept of scale. In: The Elgar Companion to Geography, Transdisciplinarity & Sustainability. Sarmiento, F & Frolich, L. (Ed.). London : Edwin Elgar, 2020. p. 49–66.

This publication URL: https://archive-ouverte.unige.ch/unige:157290

Bernard Debarbieux and Jörg Balsiger (2020) Sustainable development and the concept of scale, *in* F. Sarmiento and L. Frolich (eds) *The Elgar Companion to Geography, Transdisciplinarity & Sustainability, pp 49-66.* London, Edwin Elgar.

For quotation, please use the published version

INTRODUCTION

Scale is one of those concepts scientists rarely spend much time second-guessing. In the natural and social sciences alike, scale is most often seen as an intrinsic feature of observation and analysis. It is also commonly used when relating actions or policies to jurisdictional perimeters. Yet the meaning and use of scale are largely taken for granted, considered unproblematic (Herod and Wright 2002). Discussions of sustainable development are no exception: diagnosis, prognostication, and recommendation regularly materialize without extensive reflection on scale beyond the well-trodden local–global dichotomy.

This disregard ignores a lively debate that took place during the 2000s on the conceptual value and theoretical implications of the notion of scale. Often summarized under the heading "politics of scale", the debate was grounded in political economic approaches (mostly in geography) to the study of socio-economic issues revealing shifts in so-called "power geometries" (Swyngedouw 2004). While the debate on scale subsequently impacted scholarship on environmental issues (Young 2002) and political ecology (Neumann 2009), it has so far barely dealt with sustainable development itself.

Our contribution in this chapter is to address this gap by outlining a reflection on the scaling of sustainability. In so doing, we build on one of the central tenets of the earlier scale debate, namely a constructivist point of view and a focus on scale as a category of scientific, political and social practices that results from action and discourse (Moore 2008). We further question the dominant invocation of hierarchical, institutional levels for analysing sustainable development and invite researchers, social actors and policy makers to take into account more complex and nuanced perspectives that point to horizontal and network dimensions of sustainable development.

We argue that paying attention to scale in the discussion and practice of sustainable development is important for at least two reasons. First, since the pursuit of sustainable development consistently involves numerous and diverse actors, taking explicit account of the scale of a given sustainable development initiative can help ensure that the voice of all actors with legitimate stakes are heard and taken into account. Second, because sustainable development constitutes the integration of different sectors (biodiversity, transport, agriculture, energy, education, etc.), careful consideration of scale can be useful

when identifying contradictions, evaluating trade-offs, and managing conflict.

The argument we present in this chapter proceeds as follows. The next section intro- duces sustainable development as a global concept that is both the source and outcome of rescaling processes. We then take a closer look at how scaling has been used, suggesting that limiting analysis to processes of scaling up or scaling down misses much of the picture, and outlining the main reasons why this is so. The following two sections present, respectively, a way to combine the concept of scaling with framing and a way to think about the relationship between scales and networks. The penultimate section illustrates the consequences of this combination through an examination of sustainable development in two different settings: cities and mountains. We conclude with some thoughts on implications for practice and ideas for future research.

SUSTAINABLE DEVELOPMENT AS A GLOBAL REFRAMINGOUTCOME AND TOOL

The history of sustainable development as a concept closely mirrors the emergence of efforts to frame analysis and recommendations at the global scale. The early milestones of this scaling can be found in the early 1970s, a decade before the adoption of the phrase itself, when NASA pictures of the earth taken from space became an instant harbinger of a new planetary awareness, and the Club of Rome's *The Limits to Growth* (Meadows et al. 1972) and the United Nations Conference on the Human Environment held in Stockholm in 1972 made headlines around the world. The term was first used in the *World Conservation Strategy* published by the International Union for the Conservation of Nature and Natural Resources (IUCN) in 1980 and became popularized at the end of the decade with *Our Common Future* (also known as the *Brundtland Report*), the landmark report issued by the United Nations World Commission for Environment and Development (United Nations 1987).

The United Nations Conference on Environment and Development (UNCED) held in 1992 in Rio de Janeiro put the notion at the very core of the international community's reflections and recommendations. During the following 25 years, the concept was consolidated as a major reference, if not a guideline, upheld in global conferences – especially the 2002 World Summit on Sustainable Development held in Johannesburg and the 2012 United Nations Conference on Sustainable Development (nicknamed "Rio120" and held again in Rio de Janeiro) – as well as the action plans of major global organizations such as the World Bank. With the adoption of the 2030 Agenda for Sustainable Development in 2015, including the Sustainable Development Goals (SDGs), the concept has assumed a central place in stimulating action "of critical importance for humanity and the planet"(United Nations 2015).

The framing of sustainable development as a global issue has been the combined result of two scaling processes, one that entails the scaling up of constituent

issues and one that relates to the identification of new issues at the global scale from the outset. The first process (scaling up) can be illustrated with reference to concerns over poverty and deforestation that appeared in the nineteenth century. In both cases, increased national awareness was linked to the experiences of industrializing societies, in this case the impact of energy and building demands on forest resources and the socio-economic consequences of rural destabilization and rapid urbanization. The two phenomena are of course much more complex, but the point here is that public policy issues found today on sustainable development agendas originally manifested at local and national levels. The scaling up of these issues took decades, as developments such as nature conservation, the emergence of welfare states and decolonization found legislative approval around the world, spurred by diverse patterns of policy transfer and policy diffusion. Indeed, government officials and scientific experts could build on extensive experience by the time they undertook to rephrase and reframe traditional concerns for inclusion in global sustainable development discourse.

The second process (the framing of emerging issues at the global scale from the outset) can be illustrated with the cases of the ozone hole and global warming. Formulated for the first time during the 1970s and 1980s, these two environmental problems had not previously been identified below the global scale. It is true that related issues were known and discussed under different names (e.g. air pollution or desertification), but they were rephrased and embedded in new vocabulary thanks to the collection and analysis of new types of data at the global scale. Their initial framing as global problems was also facilitated by the fact that problems could be caused in one place but their consequences observed somewhere else. As a consequence, the global scale is now upheld as the most relevant scale for observation, diagnosis and decision making: global problems require global solutions appears to have become a "new" old adage.

Regardless of whether emerging problems have appeared on the global agenda by means of scaling up processes or of an initial global framing, these problems, whose histories of identification have been widely analysed in various disciplines and for various issues (see, e.g., Debarbieux and Rudaz 2015, Litfin 1994) have become associated with the concept of sustainable development as an overall framework for devising solutions tothese same problems.

While sustainable development can be considered an outcome of reframing processes that scale problems and solutions up to (or originating at) the global scale, it has at the same time become a tool for scaling down from the global scale. Most of the major initiatives designed to consolidate sustainable development as a global principle have unfolded inside the United Nations and its specialized organizations. It should therefore come as no surprise that even as states contribute to a global sustainability discourse, the responsibility for

implementing sustainable development would ultimately lie with states(and their constituent parts). For example, the final declarations of the Johannesburg and Rio120 conferences make repeated reference to the national, subnational and local as the main institutional scales. To take but one of numerous examples of this kind, Morocco illustrates how global norms are transferred to the national scale in order to demonstrate how the country participates in international mobilization (and is able to take advantage of international opportunities) around sustainable development: the introduction to the final document of the 2015–2020 Moroccan National Sustainable Development Strategy adopted in 2011 considers it to be "a concrete reply to international commitments of Morocco and a way of getting recognition of donors and the international community" (Stratégie Nationale de Développement Durable, Ministère de l'Energie, des Mines et de l'Environnement, Gouvernement du Maroc. 2017; authors' translation).

Scaling down is not limited to a transfer from the global to national levels. Based on the common idea that sustainable development initiatives are more effective at the local level (for a critical view, see Brown and Purcell 2005), or following decentralization trends, several states have also implemented an internal downscaling of their sustainable develop-ment policies, requiring or encouraging subnational authorities and/or cities to adopt their own sustainable development visions and plans, for example through Local Agenda 21 (Brodhag 2005; Brodhag and Talière 2006; Gibbs and Jonas 2000, 2001; Lafferty and Eckerberg 2013).

Limitations of the Upscaling/Downscaling Model

Though useful for tracing vertical shifts of authority along a continuum between centralization and devolution, a narrow view of scaling sustainable development practices that only considers upscaling and downscaling is neither fully relevant nor sufficient. Treating sustainable development exclusively (even primarily) as a feature of territorial policies and relations between territorial levels greatly oversimplifies and distorts the spatial and scalar issues and processes related to sustainable development. Below we elaborate four key limitations of the model.

First, the upscaling/downscaling perspective focuses on a strictly territorial, vertical, and (Russian doll like) hierarchical approach to sustainable development; it is fixated on institutional levels rather than on scales broadly speaking: the global level correlates to aninternational regime, while downscaling processes are seen to proceed through increasingly more local territorial levels (states, provinces, districts, municipalities) where variants of Local Agenda 21 can be adopted. Arrangements of institutional levels are of course crucial for understanding sustainable development policy making; however, they are not the only forms of scalar processes that should be seriously taken into account. A

much wider range of meanings of scale (scale-as-size, scale-as-level, scale-as-functional-scope)as used by the various stakeholders, especially scientists, needs to be taken into account when analysing sustainable development.

Second, the upscaling/downscaling model does not sufficiently recognize autonomy at any specific political level. In particular, it has a tendency to view the local level as little more than the end-of-the-pipe in sustainable development policy making within a purely hierarchical system of dependence. On the contrary, research has shown that local initiatives can directly adopt global norms without steering or guidance from national or subnational levels (e.g. cities implementing international treaties such as on climate change); conversely, local actors may directly influence international rule making, bypassing national governments or even influencing national governments via pressure from above (the famous boomerang pattern of influence stipulated by Keck and Sikkink 1998). In general, multidimensional domains are often subject to complex multilevel architectures of separate but interlinked regulatory sites that constitute contested arenas of cooperation, norms diffusion and policy learning (Ansell and Balsiger 2011).

The concept of glocalization (Robertson 1995), which denotes the local institutionalization of a global trend, is useful for understanding sustainable development. But, more important, a local sustainable development agenda or other local initiative can take shape without explicit connection to any global or national policy. During the last decades, we have been witnessing the rise of such initiatives in various fields: the so-called "territorialists" have promoted urban projects described as "sustainable self- development projects", denying any capacity to actors other than the people living there to act in this direction (Magnaghi 2005). Several actors in Europe and North America have initiated alternative food systems guided by sustainability objectives in order to fight environmental, social and health problems generated by industrial food production, global supply chains and multinational business, without acting under the recommendations of any global or national agenda (Goodman et al. 2012; this example is further developed below). It is thus highly reductionist to think of local sustainable development initiatives as miniatures of regional or national initiatives. Sustainable development is not fractal (Godard, 1994); its characteristics vary tremendously from place to place, from scale/level to scale/level.

Third, the upscaling/downscaling is based on the idea that international regimes are only defined by state coalitions or consensus (or power relations between states), that action for sustainability is mainly shaped by international recommendations and state policies, and that it is organized in the public sphere. While this does not leave much room for stakeholders other than states and international organizations, it is well known that many other types of stakeholders – private companies, scientists, non-governmental organizations

(NGOs), the media, celebrities – have played important roles in defining sustainable development. Indeed, it is not so easy to assign companies, scientists or NGOsto a single institutional level or even to some kind of scale (nor is it easy to determine what kind of scale they promote when they engage in sustainable development initiatives). Even where the role of civil society is called for (i.e. in both Agenda 21 or Agenda 2030), interaction is supposed to focus on their respective governments, thus ignoring that civil society is able to organizes itself and to influence policies and practices in various, including unconventional, ways. This third limitation illustrates the tendency of many analysts of sustainable development (and some of its promotors at the global scale) to fall into what John Agnew (1994) has called "the territorial trap", i.e. to get exclusive attention to territorial actors (states, inter-state organizations, sub-state institutions) when dealing with complex arrangements of stakeholders or to look at all socio-political and socio- economic processes with territorial lenses.

Fourth, a view of sustainable development scaling that posits vertical embeddedness as the principal axis of transposition misses the multidimensional character at the heart of sustainable development. Because each of these domains – think of them as scales – has its own functional logic and specific spatialities, it is virtually impossible to unify them in a single territory. A concept that is more useful for capturing the scalar dynamics of sustain-able development is heterarchy, which refers to situations where overlapping elements lack a clear ranking and have varying degrees of connectivity (Balsiger 2012; Crumley 1995).

SUSTAINABLE DEVELOPMENT AS SCALES AND FRAMES

Different paths can be followed when trying to escape these forms of oversimplification and to improve our understanding of sustainable development scaling. These paths sharein common the idea that scale (as size, as level, as scale-level, or as relation) is shaped by discourse and action, requiring broader or alternative conceptions of the spatiality/scalarity of collective action from those illustrated in the first section of this chapter. In this section, we suggest that scaling (as a tool for spatializing problems and solutions) be considered as inextricably linked with framing (as a generic mode of defining problems and foreseeing solutions), as hinted at above.

Sustainable Development as a Framing Practice

The concepts of frame and framing emerged in political sociology and political science inthe late 1980s, particularly through the work of David Snow and Robert Benford (1988, 1992). As specialists of collective action and social movements, they focused on framing as a means to "assign meaning to and interpret relevant events and conditions in ways that are intended to mobilize potential adherents

and constituents, to garner bystander support, and to demobilize antagonists" (Snow and Benford 1988, p. 198). They also proposed a clear distinction between three "functions" of framing: (1) diagnostic framing, which points at "some event or aspect of social life as problematic and in need of alteration"; (2) prognostic framing, which draws a solution from the respective problem; and (3) motivational framing, which is a "call to arms or rationale for engaging in ameliorativeaction" (1988, p. 199).

Similarly, Rein and Schön (1993, p. 146–148) define framing as "a way of selecting, organizing, interpreting, and making sense of a complex reality to provide guideposts for knowing, analysing, persuading, and acting" and, more generally, that a frame "is a perspective from which an amorphous, ill-defined, problematic situation can be made sense of and acted on".

From these perspectives, sustainable development can be considered as a frame and a way of framing, that is, a particular way of pointing at a problem and creating the problemat the same time, a way of shaping solutions or alternatives, of saying what is good and what is bad.

Sustainable Development as a Scaling Practice

Scale "is not simply an external fact awaiting discovery but a way of framing conceptionsof reality" (Delaney and Leitner, 1997, p. 94). In other words, scale is not an intrinsic quality of space and spatial relations but has to be understood as a spatial modality of framing. This holds true in scientific discourse as well as in socio-political practice.

Scientists use various conceptions of scale and various sets of scales, all more or less strongly derived from the scientific framing of the reality they want to analyse. For socialscientists working on issues of governance, as noted above, scale is often synonymous withinstitutional level (see above). To natural scientists, scale is often a methodological device for focusing on some part of reality, for example when selecting a spatial frame for observation or mapping (biodiversity indicators, socio-economic inequalities, epidemiologic data, etc.). Scale is sometimes considered as the structural level at which biophysical (biotopes, ecosystems, biomes) or social realities (neighbourhoods, urban areas, regions) appear to be organized. In short, scale in this sense is an epistemic construction tied to the observer's model of understanding. As Sayre (2009, p. 98) wisely notes, "scales required for an analysisdepend on the related issue, always particular, at hand". In other words, scientists do not have a common conception of what is a scale and how to mobilize the notion.

Socio-political conceptions are not that different. They also combine institutional levelsand spatial frames for describing reality, along with frequent invocations of the "global", the "regional" or the "local" devoid of any formal explanation of

their respective meanings. What makes their rhetorical use of scale different from much scientific work is that the latter mobilize tools, instruments, and analytic models in an effort to render their way of scaling reality scientifically objective. By contrast, mundane use of scale, while often implicit, is always related to the interlocutor's own framing of reality and intention to exert influence within the social world.

As a consequence, "the politics of scale may often take the form of contending 'framings'" (Delanay and Leitner 1997, p. 95) and the academic analysis of such politics should focus on the "scalar practices of social actors", not on scale itself as an analyticalcategory (Moore 2008, p. 212). For this reason, Kurtz (2003, p. 894) proposes the concept of "scale frames", defined as "discursive practices that construct meaningful (and action- able) linkages between the scale at which a social problem is experienced and the scale(s) at which it could be politically addressed or resolved".

In other words, scaling and framing are always entangled. Actors who invoke sustain- able development are always simultaneously involved in its framing and its scaling, arguing for and shaping spatial issues and solutions according to their own vision, but also in concert or competition with one another. Scalar framing, beyond being useful to "spatially 'frame' problems and solutions", allows stakeholders to "include or exclude certain actors, legitimate political projects, rework relations of power and coalesce political processes around particular scalar orders" (Moore 2008, p. 218).

CONVERGENCE, ADJUSTMENT AND COMPETITION IN THESCALE-FRAMING OF SUSTAINABLE DEVELOPMENT

The fact that virtually all territorial organizations are invited to adopt sustainable development strategies and policies (and that many are indeed doing this) implies a convergence, where sustainable development has become a potentially universal way of framing present and future in the sense that full implementation requires universal participation. But this universality and its framing at the global scale also involves stakeholders other than territorial authorities: many multinational corporations (by themselves or within formal associations such as the World Business Council for Sustainable Development), scientists and their networks, and NGOs have adopted their own sustainable development agenda.

What kinds of scale are at stake here? One relates to scale-as-size: the globe as the size at which corporations, organizations and networks may happen to develop. The other relates to scale-as-level: the global level at which all-embracing visions and agendas aredefined and for which actors design their own sustainability strategies. The promotion of Partnerships for Sustainable Development in the wake of the 2002 Johannesburg Summit and their

implementation at the global scale are a good illustration.

This adoption of the global scale of action by a wide set of heterogeneous actors helps explain the success of the global framing of sustainable development. Scholars in different fields have proposed concepts such as transnational advocacy networks (Keck and Sikkink 1998) or global civil society (Lipschutz 1996) to capture the ideathat an increasing number of non-territorial actors are engaging at this scale, challenging the common meaning of the global as an inter-state sphere, and promoting alternative conceptions of authority (from hierarchical authority to moral spheres of authority; see Rosenau 2000). In other words, the stakeholders of these global arrangements have either reframed the global scale as an alternative "discursive space" (Ford 2003, p. 129), or they have adjusted to become involved alongside inter-governmental organizations and states in an all-encompassing process aimed at producing a common agenda, thereby transcending institutional levels and heterogeneous networks. The unprecedentedly participatory development of Agenda 2030 can be seen as an example of such cooperation between states, inter-state and non-state actors as well as millionsof contributors (Geller 2016).

Upscaling and Downscaling Sustainability in Multi-stakeholder Arrangements

Beyond the upscaling and downscaling processes proper to state (including sub-state andinter-state) institutions, other processes involving similar or alternative sets of scales areobserved within non-state or multi-stakeholder arrangements. Alternative food systems are a good illustration of this. As noted above, the development of such systems since the 1970s has been based on a critique of globalization spearheaded by multinational corporations and global free trade agreements (from GATT (General Agreement on Trade and Tariffs) to WTO (World Trade Organization)). Alternative food systems havehad various priorities – favouring local circuits of production and commercialization (for reducing carbon footprints and promoting social interactions between producers and consumers), limiting intermediaries and ensuring decent remuneration of producers (for contributing to their well-being and acting for socio-economic justice), increasing food quality standards (to fight illnesses frequently associated with industrial food such as obesity and allergies), and providing monetary revenues to small producers living far from markets (for reducing socio-economic inequalities and keeping alive marginal socio-territorial systems). One can easily recognize various ingredients used for framingsustainability during the last decades.

What kinds of scale, upscaling and downscaling processes do these alternative food systems promote? To begin with, the reference to the "local" is omnipresent: many of these alternatives have been invented in very specific places and most of them are especially attentive to sustaining local systems of

production. However, other scales are also at stake due to upscaling dynamics, especially scale-as-size (often regional, national or transnational) for which alternative private distribution systems have settled, and scale-as-level (state and European Union (EU) for example) at which labels and standards are defined and legalized (municipalities, subnational levels) and at which these kinds of alternatives have been translated into policies (such as the promotion of local products in public services; see Pitt and Jones 2016). Simultaneously, downscaling has occurred (literally speaking) at the initiative of NGOs or private companies when encouraging local producers to adopt standards and norms required to enter alternative networks of distribution. The example of alternative food systems demonstrates how framing and scaling can be combined, and how fundamentally political both operations are.

A closer look at the role of scientists reveals still further evidence of complex scaling and framing dynamics relating to sustainable development. Scientists have their own way(s) of dealing with scale, but they are also important actors in sustainable development policies and initiatives. They provide conceptual expertise related to the notion of sustain- ability itself, carry out assessments of (natural, social, economic, or integrated) systems sustainability, and sometimes promote alternative or improved practices. Under the term "epistemic communities" popularized by Peter Haas (1990), scholars have shown great interest in the various roles of scientists. As in the case of alternative food systems, this raises questions about their scalar practices.

When academic expertise contributes to greater understanding and assessment of (natural, social, economic) systems sustainability as well as the promotion of alternative or improved practices, scientists are keen to rely on scalar systems. However, as noted previously, scientists rarely share a common conception of scale. Instead, when working on specific issues related to sustainable development, they invoke a specific set of scales in accordance with the indicators and data they use, or the way they frame a scientific question in the first place. In the domain of sustainable development, the scales at which problems such as health, poverty problems, gender imbalance, or risks related to climate change are observed differ greatly. The question then becomes whether and how the (huge variety and heterogeneity of) sets of scales adopted by scientists match the scales and networks of actual sustainable development strategies? The most frequent answer is: by simplification. When scientists from different academic fields are willing to contribute to assessing or promoting sustainable development policies, experience shows that they usually adopt a rather simple set of scales.

One example of simplification as a strategy for overcoming complexity can be found in a recent report on the assessment of urban sustainability. After recalling the difficulty of taking into account the large variety of scales required by an analysis of climate change mitigation and adaptation related to urban biotopes

and ecosystems, the authors propose to "choose a scale set (city–region, neighbourhood–district, site–block) that would help in considering scalar aspects of each benefit (of various types of green urban Infrastructure) but still be simple enough to allow a general overview" (Dawson et al. 2014, p. 155).

Another example is the simplification frequently found when devising indicators for biodiversity conservation and ecosystem services that adequately reflect the social and policy dimensions. In a contribution by the Stockholm Resilience Centre and the International Council of Scientific Unions to a United Nations General Assembly meeting on sustainable development, the authors suggest that "the task of developing more integrated and scalable indicators will be crucial for SDGs" and that "using indicators thatmake sense on a local scale and then possible to scale up on a regional and global scaleopens up the possibility to engage local stakeholder, citizen groups, indigenous groups and many other knowledge holders in the monitoring, reporting and development of the SDGs" (Norström et al. 2014). The demand for sustainable development indicators to be "scalable" suggests that scale does not matter for operationalization, nor does it matter at what scales scientists analyse the related issues.

SCALES OR/AND NETWORKS?

Our analysis of scalar practices by various types of stakeholders has so far left aside an important spatial feature, namely that most actors are networks and adopt network practices, even if this is more evident for multinational governments, social movements or scientific consortia than for state actors. The questions this raises are the following: are scalar practices and network practices two independent dimensions of institutional practices? If not, how are they linked? Is scaling essentially a network activity and net- working a scalar activity? To these very general questions, observations of the dynamics of sustainable development initiatives can bring important elements of a response.

Before dealing with sustainable development itself, however, it is necessary to stress that territorial institutions such as states or municipalities are also social networks. What constitutes the glue between the various units of a government, an administration, or a territory are the direct and indirect relationships that public officials and inhabitantsof a given territory are able to develop. Sustainable development policies illustrate thiswell. One of the main challenges governments committed to sustainable development encounter is how to connect sectoral policies (and administrations) in ways that generate integrated, or at least complementary contributions to, overarching sustainability goals. Therefore, the ability of a state to implement sustainability policies relies in a large part on its capacity to function as a complex network.

A similar logic applies to the downscaling of some policies. States that encourage

or force subnational authorities to elaborate sustainable development strategies, thereby activating the hierarchical dimension of scalar organization in public institutions, often devise accompanying measures that emphasize networking such as training, collection and dissemination of best practices, study visits or technical backstopping. The same can be said at the global level: international agreements on sustainability commit states and only states; but their elaboration (through negotiations) and implementation (e.g. through peer reviewing of national sustainable development strategies; see Meadowcroft 2007) involve complex networks of diverse actors.

Attention to the network dimension of sustainable development policies creates a deeper understanding of their scalar dimension. Networks' horizontal character contributes not only to the transfer of sustainability practices at upper and lower scale-levels, but also their diffusion at larger scale-sizes. Geographers who have shaped the field of "policymobilities", studying the practical modalities of the spatial dissemination of models of policies, have shown how sustainable development policy models have experienced such a mobility: in some cases policy mobility has led to the emergence of ad hoc neologisms such as "Vancouverism", as stylized, packaged understandings of complex "local" approaches to urban planning, design, and redevelopment first analysed in Vancouver, Canada (McCann and Ward 2012).

While the network dimension of sustainability is important for all types of actors, it ismost prominent among non-state actors. The main reason for this is that, as much of an oversimplification the downscaling/upscaling model may be, it is difficult to ignore the constitutional rules that tie territorial authorities to a specific level (municipality, district, province, etc.) by means of a jurisdictional envelope. In turn, territorial authorities, in contrast to non-state actors, have greater means to seek a fit between the scale of a problem and the scale of a solution.

SCALING SUSTAINABLE DEVELOPMENT FOR CITIES ANDMOUNTAINS

In the previous sections we have drawn attention to the consequences of taking for granted the notion of scale when analysing and practising sustainable development. We have proposed that considering scale through the prism of framing and being attentiveto the role of networking practices can contribute to a more nuanced understanding of what has become one of the most important global norms. In this section, we combine our analytical arguments, or focus on more specific ones, to show why and how observersconsider certain types of geographical objects and associated scales to be especially relevant for sustainable development. We illustrate this with reference to cities and mountains.

The Scale-Network Issue: Framing and Scaling (Sustainable) Cities

There is a wide consensus among scholars and policy makers that cities play a crucial role in sustainable development. With more than 50 per cent of the world population and roughly three-quarters of global economic activity, the United Nations Human Settlement Program (UN-HABITAT) estimated in 2011 that cities are the source of 70 per cent of global greenhouse gas emissions (UN-HABITAT 2011).

Consequently, many international initiatives (such as the Habitat programme and Agenda 21) or supranational organizations (such as the EU through the 2007 Leipzig Charter on Sustainable European Cities) have promoted sustainability assessments and the implementation of sustainable development plans for urban areas. In the 2030 Agenda, SDG 11 specifically seeks to "make cities and human settlements inclusive, safe, resilient and sustainable" (United Nations 2015; see also Parnell et al. 2014).

How can we explain such focused attention, especially when considering cities in comparison with such weighty SDG topics as hunger, poverty, or life on land? For some observers, the reasons are to be sought in the specificity of the object. For others, it is mainly a question of scale. Only a few suggest that both arguments are valuable. The first argument was used during debates on the opportunity of having an urban SDG, for instance in the form "urbanization and urban phenomena touch on all aspects of sustainable development" (Parnell et al. 2014, p. 38). In this view, cities are seen to some- how embody the necessity of integrating all the other SDGs. The second argument was mentioned above when we referred to the popularity of the "local" scale in sustainability projects: social interactions at the local scale and the material condition of daily life of those who interact are said to favour sensitivity to sustainability issues (Moore 2007). Moreover, it is often suggested that cities, being locales inhabited by heterogeneous actors, some being wide open to collaborative practices, are natural laboratories (Evans et al. 2016); both arguments are combined in such a statement.

So let us assume that cities are a good context and a good scale-size for sustainability initiatives. But do they teach us anything more in terms of scaling? Does the involvement of numerous urban actors and stakeholders in sustainable development initiatives illustrate upscaling or downscaling processes or other dynamics in the scalar practices of actors?

In a recent study based on a panel of 200 large and medium-sized cities across 11 European countries Reckien and colleagues (2014) showed that 65 per cent have adopted climate change policies at least in terms of mitigation planning (energy savings and efficiency, transport, buildings, etc.), with half of these combining mitigation and adaptation planning (urban planning, water management). The same study shows that the involvement of cities in such

plans is not correlated with the existence and ambition of a national plan: if many French, British and German cities seem to take advantage of ambitious national plans, cities in the Netherlands, which often combine mitigation and adaptation plans, do not have a national plan to back their efforts. We are invited to conclude from this study that municipal governments are an innovative milieu for sustain- able development initiatives, but not a level activated by downscaling processes. A very popular book has recently made the same argument: Benjamin Barber (2013) attracted some attention when he stated that the future of a sustainable world is in the hands of the mayors of big cities, in part due to their capacity to cope with challenges that states are no longer able to address.

However, here again, it is overly simplistic to explain the commitment to sustainable development by urbanites and city governments as the result of a totally autonomous dynamic driven by the nature and size of cities as a type of place. First, echoing one of Barber's claims, sustainable development dynamics among urban elites should be seen in the context of strong ties connecting elected representatives and technicians, ties that facilitated the transfer, adaptation or duplication of experiences. It is no coincidence that the so-called "policy mobilities" field has mainly studied urban policies (McCann and Ward 2011; Söderström 2014). Moreover, such ties tend to become more institutionalized over time as national and "transnational municipal networks" (Bulkeley et al. 2003) or "inter-urban networks" (Leitner and Sheppard 2002).

Bulkeley and Betsill (2003) have studied one of these networks, Cities for Climate Protection (CCP), a Local Agenda 21 campaign set up in 1993 by the International Council for Local Environmental Initiatives (ICLEI). Commenting on this case study from the perspective of a theoretical discussion on the concepts of scale and networks, Bulkeley (2005, p. 880) recalls that such networks are "influential in so far as they shape the range and extent of state action, but are also an important site for the governance of global environmental issues in their own right". She continues to suggest that "political authority is not confined to territorially delimited entities, such as global regimes and nation-states, but accrues in non-state spaces" (Bulkeley 2005, p. 881). However, based on her analysis of CCP, she insists that "networks have a scalar dimension", this dimension referring to spatial extension (size) as well as "the ways in which they operate and the ways in which they are framed, configured and crystallised" (p. 888). Bulkeley shows how CCP sought "to rescale climate change as an issue with local causes and consequences" and to "reframe issues which are institutionalized and imagined as local . . . and having global dimensions" (p. 893).

This discursive process of (local–global) rescaling involves sponsors of the network such as the European Commission and national governments. Yet its translation into action requires the existence of (often nationally defined) judicial tools, even as the CCP "bypasses the nation-state and gives local authorities the

opportunity to take a position that may go against that of their national governments (as in the case of Australia and the US)". This interplay between various institutional scale-levels leads Bulkeley to caution against any polarization of the debate into "scalar" and "non-scalar" perspectives. The CCP illustrates that networks may be part of the politics of scale. CCP "involves attempts to reframe an issue which is usually considered in global terms within practicesand institutions which are circumscribed as local, attempts by state and non-state actors to re-hierarchize the relations between different levels of governance in relation to climate change, contests over the appropriate scope and reach of municipal governments, etc." (pp. 893–895).

Last but not least, the participation of scientists should also be highlighted as a parameter in this analysis of the scaling of discourses and actions of sustainable urban development. As noted earlier, one of the challenges scientists face is that the scale at which they carry out their research often does not match the scale at which they becomeinvolved as expert practitioners. Hence, scientists who carry out sustainability assessments at urban scales and who foster sustainable development policies regularly find thatthe level at which the latter are defined and implemented does not fit the complex scalar systems involved in expert analysis of urban sustainability. A group of scientists studying urban sustainability in 39 European cities from 26 countries concluded after five years that "the policy or decision scales differ from the scales for which the (integrated assessment) models were originally developed. The change of scale in integrated assessment modelling approaches involves up- and downscaling of model inputs, model parameters and adaptations of model equations in order to make predictions at the policy scales" (Dawson et al. 2014, p. 20). This disconnect is often reinforced because scientists may have to rely on data provided at an institutional scale (municipalities, urban districts) when studying drivers and effects, making it still more difficult to understand the mutual influence of academic and political scale-levels.

The Regional Issue: Framing and Scaling (Sustainable) Mountains

Mountain regions are often held up us as special places characterized by topological and climatological complexity, water and biodiversity richness, climate sensibility, isolation, marginality, inaccessibility and diverse cultural heritages (Balsiger and Debarbieux 2015). Because each of these features has its own spatiality (e.g. water basins, transport corridors, ethnolinguistic distribution), efforts to frame a "mountain scale" can combined them in different ways and have in fact varied around the world (Balsiger and Nahrath 2015). Where mountains are constructed as political objects and institutionalized through policies and projects, scale-as-size and scale-as-level are often confounded, particularly where policy implementation is linked to a devolution to lower administrative levels.

Like cities, mountains are seen as natural laboratories for sustainable development yet mountains have not obtained a dedicated SDG in the 2030 Agenda: they are mentioned only three times in targets associated with SDGs 6 (Clean Water and Sanitation) and 15 (Life on land). Yet mountains have been on the global agenda at least since the 1992 Rio Conference, where countries adopted Agenda 21 with a chapter dedicated to mountains.

Two factors explain why mountains have found a place in global sustainable development discourse and practice. First, mountains are specific geographical objects that lend themselves to sustainable development, mainly because policy interest in mountains has always required some effort at policy integration due to the implication of various sectors of the economy. Second, mountains are of relevance to sustainable development because of scale. Even though mountain ranges usually cover large areas and cross-national boundaries (scale-as-size), the way mountains are framed in policy relates to a strong local dimension, for example with regard to community-based resource management (scale- as-level) jeopardized by the exposure of local populations to economic and financial globalization (scale-as-relation). In other words, the scale of a mountain or mountain range only makes sense when it is considered in the context of how it is framed.

The construction of mountains as a global environmental political object (Rudaz 2011) has involved upscaling and downscaling dynamics, but also more complex processes testifying to the need for a nuanced understanding of the notion of scale. Several European countries established mountain laws in the late nineteenth century. Efforts to scale these up to the regional level date from the 1950s, when the International Commission for the Protection of the Alps (CIPRA) was founded with the goal of creating an international treaty to protect the Alps (initially from tourism). An Alpine Convention was ultimately signed in 1991, followed by a Carpathian Convention in 2004, establishing the region (as size and as level) as an appropriate locus for policy and action.

By the mid-1990s, sustainable mountain development was an established policy item at the global and many regional levels. With the designation of 2001 as International Year of Mountains, downscaling processes could also be observed. In numerous countries around the world, national mountain committees newly established for the occasion fostered cross-sectoral dialogue and policy coordination, in some cases leading to the adoption of mountain laws (Kohler et al. 2012).

Ultimately upscaling and downscaling processes linked to mountains as a locus of sustainable development intersect with two types of regionalization, each with its own distinct framing. The first type of regionalization evolves around supranational cooperation as a tool that is argued to be specially relevant for the given issue (sustainable development) and level (inter-state), thus loosely following the EU's 2001 Gothenburg Strategy for Sustainable Development. This type of

regionalization is reminiscent of the hierarchical-vertical model introduced at the outset of the article and, while found useful in some contexts, dismissed as too simplistic. By contrast, the second type of regionalization entails the identification of ad hoc regions, sometimes called project regions (Debarbieux et al. 2015) or functional regulatory spaces (Varone et al. 2013; see Balsiger and Nahrath 2015 for an application to mountain regions), which relate to a specific issue framing such as sustainable development and entails the creation of ad hoc institutions at the regional level.

It is this second type of regionalization that opens the door to a more nuanced treatment of scaling such as we have suggested in this article. The first reason this is so is that ad hoc regionalism is typically less formal and thus more open to non-state stakeholders. For Allen and Cochrane (2007, p. 1161), a "region" is "an assemblage of political actors, some public, some private, where elements of central and local government are 'lodged' within the region, not acting above or below it". These participate in the construction of regions, but coming from very different points of departure. While some actors, such as subnational authorities, adhere to strictly jurisdictional scales, others such as transnational NGOs are engaged in ecoregional mobilization (Balsiger 2009) and thus operate in an entirely different scale (note how the term rescaling leaves its vertical, Russian doll like model, referring rather to a switch in the very logic of a scalar structure).

The second reason why ad hoc mountain regionalism provides additional insights into scaling is precisely because such regionalization evolves around functional regions, of which there are many, often overlapping in heterarchichal arrangements. A heterarchical view of scaling has significant implications for how sustainable development practices are organized. Unlike in a vertically embedded setting, where horizontal, cross-sectoral integration takes place within given levels (municipal, cantonal, national, international), policy coordination in heterarchies depends much more on non-territorial policy entrepreneurs working at the interstices of transnational functional spaces.

Finally, though present in the first type of regionalization, the varied and various roles of scientists are brought into relief in the second type of regionalization, where considerably more time is spent on rescaling efforts. Around the world, regional scientific collectives have contributed to these efforts, but in very different ways (Debarbieux et al. 2014). In their survey of scientific organizing at the scale of mountain ranges, Debarbieux and colleagues identify four kinds of regionality – realist, representational, institutional and socio-political regionality – and suggest that rescaling processes of scientific cooperation correlate with the regional governance model found in a given mountain range. In the Alps and the Carpathians, for instance, there are scientific collectives established as counterparts or formal regional governance initiatives. As a consequence, the scientific framing of the mountain scale mirrors the governance focus of the respective instrument. By contrast, where governance

rescaling emerged in the context of EU territorial cohesion programmes, such as in the Jura and the Pyrenees, we find techno-scientific networks that meet specific data and information demands.

CONCLUSION

Our point of departure in this chapter was the observation that contemporary discussions of sustainable development have largely ignored the insights from recent debates on the concept of scale. As a consequence, a simplistic view of rescaling limited to vertical authority shifts along jurisdictional levels dominates sustainable development theorizing and practice. To be sure, the continued importance of national sovereignty as an international norm, combined with the inter-governmental nature of the organizations driving the global sustainable development agenda, has meant that implementing global initiatives and programmes such as the 2030 Agenda largely rely on state-based channels and instruments. At the same time, we have argued that too narrow a view of scale can lead to a neglect of actors operating at scales other than those sanctioned in official discourses and covered in mainstream media. Ignoring the full diversity of actors involved in sustain-able development creates the added risk of losing sight of spatial logics such actors follow because of the issues they represent.

To develop a better understanding of sustainable development through the prism of scale, however, is no easy task because scientists are uncritical in their own use of the concept; conflate scale-as-size, scale-as-level and scale-as-relation; or because the scales they use in their scientific work are not the same as those they face when engaging in concrete practices. Beyond the need to pay greater attention to these differences, we build on the politics of scale literature and suggest two ways for fostering clarity. The first consists of linking the concepts of scale and frame because scales are never just out there to be discovered but rather are the products of social contestation. Paying attention to the strategies actors deploy when framing what they consider appropriate scales for sustainable development can generate pivotal insights of a conceptual and practical nature. The second involves greater recognition of the network dimensions of sustainable development, which in turn facilitates appreciation of its scalar dimensions. The short case studies of cities and mountains are meant to illustrate these points.

REFERENCES

Agnew, John (1994), 'The territorial trap: The geographical assumptions of international relations theory', *Review of International Political Economy*, **1** (1), 53–80.

Allen, John and Allan Cochrane (2007), 'Beyond the territorial fix: Regional assemblages, politics and power', *Regional Studies*, **41** (9), 1161–1175.

Ansell, Chris, and Jörg Balsiger (2011), 'Circuits of regulation: Transatlantic perspectives on persistent organic pollutants and endocrine disrupting chemicals', in David Vogel and Johan F. M. Swinnen (eds), *Transatlantic Regulatory Cooperation: The Shifting Roles of the EU, the US and California*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar Publishing, pp. 180–199.

Balsiger, Jörg (2009), 'The impact of ecoregional mobilization on mountain policies in the Swiss Alps and California's Sierra Nevada', *Journal of Alpine Research/Revue de géographie alpine*, **97** (2), 39–59.

Balsiger, Jörg (2012), 'New environmental regionalism and sustainable development in the European Alps', *Global Environmental Politics*, **12** (3), 58–78.

Balsiger, Jörg, and Bernard Debarbieux (2015), 'Should mountains (really) matter in science and policy?', *Environmental Science & Policy*, **49**, 1–7.

Balsiger, Jörg, and Stéphane Nahrath (2015), 'Functional regulatory spaces and policy diffusion in Europe: The case of mountains', *Environmental Science & Policy*, **49**, 8–20.

Barber, Benjamin (2013), *If Mayors Ruled the World: Dysfunctional Nations, Rising Cities*, Newhaven, CT, USA: Yale University Press.

Brodhag, Christian (2005), 'Stratégies territoriales de développement durable et rôle de l'État', DATAR (ed.), *Territoires 2030, Revue d'études et de prospective, La documentation Française*, **2**, 7–13.

Brodhag, Christian and Sophie Talière (2006), 'Sustainable development strategies: Tools for policy coherence', *Natural Resources Forum*, **30**, 136–145.

Brown, J. Christopher and Mark Purcell (2005), 'There's nothing inherent about scale: Political ecology, the local trap, and the politics of development in the Brazilian Amazon', *Geoforum*, **36**, 607–624.

Bulkeley, Harriet (2005), 'Reconfiguring environmental governance: Towards a politics of scales and networks', *Political Geography*, **24**, 875–902.

Bulkeley, Harriet and Michele M. Betsill (2003), *Cities and Climate Change: Urban Sustainability and Global Environmental Governance*, London: Routledge.

Bulkeley, Harriet, Anna Davies, Bob Evans, David Gibbs, Kristine Kern and Kate Theobald (2003), 'Environmental governance and transnational municipal networks in Europe', *Journal of Environmental Policy and Planning*, **5** (3), 235–254.

Crumley, Carole C. (1995), 'Heterarchy and the analysis of complex societies', *Archeological Papers of the American Anthropological Association*, **6** (1), 1–5.

Dawson, Richard, Annemie Wyckmans, Oliver Heidrich, Jonathan Köhler, Stephen Dobson and Efren Feliu (2014), *Understanding Cities: Advances in integrated assessment of urban sustainability*, Newcastle, UK: Centre for Earth Systems Engineering Research (CESER).

Debarbieux, Bernard and Gilles Rudaz (2015), *The Mountain: A Political History from the Enlightenment to the Present*, Chicago: University of Chicago Press.

Debarbieux, Bernard, Martin Price and Jörg Balsiger (2015), 'The institutionalization of European mountain regions', *Regional Studies*, **47**(10), 1193–1207.

Debarbieux, Bernard, Jörg Balsiger, Dusan Djordjevic, Simon Gaberell and Gilles Rudaz (2014), 'Scientific collectives in region-building processes', *Environmental Science & Policy*, **42**, 149–159.

Delaney, David and Helga Leitner (1997), 'The political construction of scale', *Political Geography*, **16** (2), 93–97.

Evans, James, Andrew Karvonen and Rob Raven (eds) (2016), *The Experimental City*, London and New York: Routledge.

Ford, Lucy H. (2003), 'Challenging global environmental governance: Social movement agency and global civil society', *Global Environmental Politics*, **3** (2), 120–134.

Geller, Joshua C. (2016), 'Crowdsourcing global governance: Sustainable development goals, civil society, and the pursuit of democratic legitimacy', *International Environmental Agreements*, **16**, 415–432.

Gibbs, David, and Andrew E. G. Jonas (2000), 'Governance and regulation in local environmental policy: The utility of a regime approach', *Geoforum*, **31** (3), 299–313.

Gibbs, David, and Andrew E. G. Jonas (2001), 'Rescaling and regional governance: The English Regional Development Agencies and the environment', *Environment and Planning C: Government and Policy*, **19**, 269–280.

Godard, Olivier (1994), 'Le développement durable: paysage intellectuel', *Natures, Sciences, Sociétés*, **4** (2), 309–322.

Goodman, David, E. Melanie DuPuis and Michael K. Goodman (2012), *Alternative Food Networks: Knowledge, Practice, and Politics*, London and New York: Routledge.

Haas, Peter (1990), *Saving the Mediterranean: The Politics of International Environmental Cooperation*, New York: Columbia University Press.

Herod, Andrew, and Melissa W. Wright (eds) (2002), *Geographies of Power: Placing Scale*, Oxford: Blackwell.

IUCN (1980), *World Conservation Strategy: Living Resource Conservation for Sustainable Development*, Gland, Switzerland: IUCN.

Keck, Margaret E. and Kathryn Sikkink (1998), *Activists Beyond Borders: Advocacy Networks in International Politics*, Ithaca, NY: Cornell University Press.

Kohler, Thomas, Jane Pratt, Jörg Balsiger, Bernard Debarbieux, Gilles Rudaz and Daniel Maselli (2012), *Sustainable Mountain Development, Green Economy and Institutions. From Rio 1992 to Rio 2012 and Beyond*. Final Draft for Rio 2012, Bern: Center for Development and Environment.

Kurtz, Hilda E. (2003), 'Scale frames and counter-scale frames: Constructing the problem of environmental justice', *Political Geography*, **22** (8), 887–916.

Lafferty, William M. and Katarina Eckerberg (2009), *From the Earth Summit to Local Agenda 21: Working towards Sustainable Development*, London: Routledge.

Leitner, Helga and Eric Sheppard (2002), '"The city is dead, long live the net": Harnessing European interurban networks for a neoliberal agenda', *Antipode*, **34** (3), 495–518.

Lipschutz, Ronnie D. (1996), *Global Civil Society and Global Environmental Governance: The Politics of Nature from Place to Planet*, Albany, NY: State University of New York Press.

Litfin, Karen (1994), *Ozone Discourses: Science and Politics in Global Environmental Cooperation*, New York: Columbia University Press.

Magnaghi, Alberto (2005), *The Urban Village: A Charter for Democracy and Local Self-Sustainable Development*, London: Zed Books.

McCann, Eugene and Kevin Ward (eds) (2011), *Mobile Urbanism*, Minneapolis, MN: University of Minnesota Press.

McCann, Eugene and Kevin Ward (2012), 'Policy assemblages, mobilities and mutations: Toward a multidisciplinary conversation', *Political Studies Review*, **10**, 325–332.

Meadowcroft, James (2007), 'National sustainable development strategies: Features, challenges and reflexivity', *Environmental Policy and Governance*, **17** (3), 152–163.

Meadows, Donella H., Dennis L. Meadows, Jorgen Randers and William W. Behrens III (1972), *The Limits to Growth*, Washington, DC: Universe Books.

Moore, Adam (2008), 'Rethinking scale as a geographical category: From analysis to practice', *Progress in Human Geography*, **32** (2), 203–225.

Moore, Steven A. (2007), *Alternative Routes to the Sustainable City: Austin, Curitiba, and Frankfurt*, Lanham, MD: Lexington Books.

Neumann, Roderick P. (2009), 'Political ecology: theorizing scale', *Progress in Human Geography*, **33** (3), 398–406.

Norström, Albert, Hanna Wetterstrand, Maria Schultz, Thomas Elmqvist, Sarah Cornell, Marcus C. Öhman, Tim Daw, Fredrik Moberg, Åsa Persson, Garry Peterson, Johan Rockström and Ellika Hermansson Török (2014), 'Issue Brief: Integrating social-ecological resilience, biodiversity and ecosystem services into the Sustainable Development Goals. A contribution of Stockholm Resilience Centre and ICSU (International Council for Science) for the 8th Session of the UN General Assembly Open Working Group on Sustainable Development Goals, New York, 4–8 February 2014', Stockholm: Stockholm Resilience Centre.

Parnell, Susan, José G. Siri, Thomas Elmqvist, Peter Marcotullio, Anthony Capon, Aromar Revi and Jo Ivey Boufford (2014), 'Making the sustainable development goals operational through an urban agenda: Perspectives from science', *Solutions*, **5** (2), 37–40.

Pitt, Hannah and Mat Jones (2016), 'Scaling up and out as a pathway for food system transitions', *Sustainability*, **8**, 1025.

Reckien, Diana, Johannes Flacke, Richard J. Dawson, Oliver Heidrich, Marta Olazabal, Aoife Foley, Jean-Paul Hamann, Hans Orru, Monica Salvia, Sonia De Gregorio Hurtado, Davide Geneletti and Filomena Pietrapertosa (2014), 'Climate change response in Europe: what's the reality? Analysis of adaptation and mitigation plans from 200 urban areas in 11 countries', *Climatic Change*, **122**, 331–340.

Rein, Martin and Donald Schön (1993), 'Reframing policy discourse', in Frank Fischer and John Forester (eds), *The Argumentative Turn in Policy Analysis and Planning*, London: Duke University Press, pp. 145–166.

Robertson, Roland (1995), 'Glocalization: Time–space and homogeneity–heterogeneity', in Mike Featherstone, Scott Lash and Roland Robertson (eds), *Global Modernities*, Thousand Oaks, CA: Sage Publications, pp. 25–44.

Rosenau, J. (2000), 'Change, complexity and governance in globalizing space', in Jon Pierre (ed.), *Debating Governance*, Oxford, UK: Oxford University Press, pp. 167–200.

Rudaz, Gilles (2011), 'The cause of mountains: The politics of promoting a global agenda', *Global Environment/Politics*, **11** (4), 43–65.

Sayre Nathan F. (2009), 'Scale', in Noel Castree, David Demeritt, Diana Liverman and Bruce Rhoads (eds), *A Companion to Environmental Geography*, Oxford, UK: Wiley-Blackwell, pp. 95–108.

Snow, David A. and Robert D. Benford (1988), 'Ideology, frame resonance and participant mobilization', in Bert Klandermans, Hanspeter Kriesi and Sidney G. Tarrow (eds), *From Structure to Action: Comparing Social Movement Research*

Across Cultures, Greenwich, CT: JAI Press, 197–217.

Snow, David A. and Robert D. Benford (1992), 'Master frames and cycles of protest', in Aldon D. Morris and Carol M. Mueller (eds), *Frontiers in Social Movement Theory*, New Haven, CT: Yale University Press, pp. 133–55.

Söderström, Ola (2014), *Cities in Relations: Trajectories of Urban Development in Hanoi and Ouagadougou*, Oxford, UK: Wiley Blackwell.

Stratégie Nationale de Développement Durable, Ministère de l'Energie, des mines et de l'Environnement, Gouvernement du Maroc (2017), http://www.environnement.gov.ma/PDFs/publication/Rapport_Strat%C3%A9gie_Nationale_DD_juin2017_Mai%202017_Web.pdf (accessed 16 February 2020).

Swyngedouw, Erik (2004), 'Scaled geographies: Nature, place and the politics of scale', in Eric Sheppard and Robert McMaster (eds), *Scale and Geographic Inquiry: Nature, Society and Method*, Oxford: Blackwell, pp. 129–153.

UN-HABITAT (2011), *Cities and Climate Change: Global Report on Human Settlements*, Nairobi, Kenya: UN-HABITAT.

United Nations (1987), *Report of the World Commission on Environment and Development: Our Common Future*, Oxford and New York: Oxford University Press.

United Nations (2015), *Transforming our World: The 2030 Agenda for Sustainable Development*, resolution adopted by the General Assembly on 25 September 2015, New York: United Nations.

Varone, F., S. Nahrath, D. Aubin and J.-D. Gerber (2013), 'Functional regulatory spaces', *Policy Science*, 46 (4), 311–333.

Young, Oran R. (2002), *The Institutional Dimensions of Environmental Change: Fit, Interplay, and Scale*, Cambridge, MA: MIT Press.