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## Scales of Political Action in the Anthropocene: Gaia, Networks, and Cities as Frontiers of Doing Earthly Politics

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### **Abstract**

The purpose of this article is to propose a new theorisation of “scale” in doing earthly politics (i.e. who is acting, who should be responsible for addressing planetary environmental degradation). I connect the politics of scale in global urban politics with the scale question in environmental politics. While the existing paradigm on “politics of scale” have made an excellent contribution on performative aspects of scale, they have failed to respond to the affirmative movements in which scholars and policy makers attempt to theorise scales as ranges in which political action can be mobilised. On the other hand, the new “down-to-earth” affirmative ecopolitics movement often fails to move beyond the romanticisation of the local, which is easily subject to criticisms, such as “local trap” where the small is not always intrinsically “good”. As an alternative, I theorise “scales of political action” that can be simultaneously both materially situated (local) and ubiquitous (global), mainly using Gaian ecology and complex theory. Finally, as a concrete example of “scales of political action”, I propose cities as frontiers of doing earthly politics, focusing on the characteristics of urban conditions that match our new theorisation of scale.

## Introduction

With the increasing acknowledgement of the arrival of the Anthropocene,<sup>1</sup> together with the popular use of “resilience” in public policy,<sup>2</sup> the concept of scale has been revived in global climate politics, this time with its unique character of invoking ecology and ecosystems.<sup>3</sup> As scholars and policy makers are now more sincerely committing to understanding how our actions/policy measures should correspond with ecosystem functions or some “spatial fit”,<sup>4</sup> “scale” is now being viewed in a new light in talking about global environmental governance and politics.<sup>5</sup> However, this new fashion is different from the scale discourse that dominated in the late 1990s and 2000s: previously, “politics of scale” mainly concerned the politics amongst subnational governments, especially with regard to how these different governmental scales function to naturalise the global neoliberal social order.<sup>6</sup> The new wave of “scale” discourse is a response to a call to radically reframe our relationship with nature, in serious attempts to frame scales of political action in environmental governance—especially respecting and complying with (rather than controlling) scales of ecosystem performance.<sup>7</sup>

Scales here are not limited to be considered *only* as products of neoliberal social relations; they are also important boundaries in which concrete actions can be mobilised. Indeed, in the early 2000s, scholars such as Swyngedouw and Heynen (2003) worked on scale in the context of political ecology;<sup>8</sup> however, their effort was more or less a continuation of the Marxist critique of global neoliberalism, in which nature is merely a background that is abused for capitalist interests—resulting in economic and environmental injustices (c.f., economically disfranchised populations tend to suffer more from environmental degradation). The grand comeback of scale today presents a different landscape: it more seriously addresses *planetary environmental degradation* in the context of the Anthropocene, wherein we are now forced to consider nature and the environment to be important stakeholders in mundane politics.<sup>9</sup> Accordingly, “nature” here is not an inanimate background merely waiting passively to be abused; rather, it is an active subject that cannot easily be controlled, which forces us to respect how it functions (e.g. its “feedback loops”) and organise our own activities around it.

The purpose of this article is to propose a new theorisation of “scale” in doing earthly politics (i.e. who is acting, who should be responsible for addressing planetary environmental degradation). I synthesise the scale problem present in both “politics of scale” (in the context of neoliberal critique) and “scale as boundaries of political mobilisation” (in the context of

the affirmative Anthropocene). I weave these two different perspectives into a theoretical trajectory of “scale”, going from a poststructural argument to an affirmative politics argument. In the second part of the article, I theorise “scales of political action” that can be simultaneously both materially situated (local) and ubiquitous (global), mainly using Gaian ecology and complex theory. Finally, as a concrete example of “scales of political action”, I propose cities as frontiers of doing earthly politics, focusing on the characteristics of urban conditions that match our new theorisation of scale: (1) a more “graspable” systemic entity that allows shared material experiences of feedback from nature (“small enough”), (2) the degree of influence and leadership of cities in global politics (“intense enough”), and (3) the extent of complexity and unpredictability that requires a holistic and nonlinear approach to governance (“large enough”).

### **Theoretical Impasse of “Politics of Scale”**

“Politics of scale”, “politics about scale”, “scalar politics”, or simply, “scale”, had been at the centre of academic endeavour between the late 1990s and 2000s, especially in the field of geography and international urban politics. Especially in the latest developments in the literature, writers were particularly committed to dismantling or de-essentialising *a priori* notion of scale, using the examples in which scales can only be understood in relation with one another under the all-pervasive influence of neoliberal power dynamics.<sup>10</sup> A decade since then, the scholarly attention on such political theorisation of scale has declined. This is partly because there have been already enough research and writings on how scales are a product of naturalising global capitalist social relations; we have reached a general agreement that scale is a relative concept, and that the idea of fixed, essentialist scales is more or less outdated.<sup>11</sup> On the other hand, the decline of work on “scalar politics” can also be attributed to the fact that this tradition has failed to accommodate the rising needs for a more affirmative conceptualisation of scale.<sup>12</sup> Scale, in the context of global urban politics, was often discussed as either (a) an utterly relative concept that is only useful for scholarly analysis<sup>13</sup> or (b) utterly subject to neoliberalism, different scales performing as mere puppets of neoliberalism.<sup>14</sup> The discussions around “politics of scale” were mostly comprised of how the urban scale, or cities as agglomerated zones, are serving the global flow of capitalist economy and its resulting socio-political relations. For instance, “scalar politics” was often used in the context of explaining “spatial fix”, where cities and urban spaces are physical manifestations of how global capitalism (and neoliberalism) operates in reality (c.f., gentrification, or inhabitant interests being pushed out by the interest of capital).

In other words, it can be said that while the efforts to tear down the fixed/essentialist categorisation of scale in politics (e.g. local/regional/national) has largely been successful, most of them have been unable to theorise a “successful progressive reconfiguration of scale”<sup>15</sup> that can challenge the status quo. This eventually resulted in “so what” questions: you understand how political concepts are constructed through repeated social processes and performances,<sup>16</sup> and yet you fail to re-invent these concepts in a way that can initiate a new tradition or concoct a social change. Hence, the dominant literature on “politics of scale” faced an impasse, *as it is unable to articulate scale as concrete ranges in which political action can be mobilised*. The idea of “performativity” of scale has always been there, but only in the sense of them acting under the script already written by capitalism, rather than actually writing the script of their own. This is one of the most acknowledged criticism made on “politics of scale”, which points out that its theoretical obsession with all-pervasive neoliberalism often strip localities of their agency.<sup>17</sup>

In short, there has been a deficiency in the existing paradigm of “politics of scale” in addressing how scales can be framed as active entities that prompt political actions. This deficiency has become ever more visible today in the context of affirmative environment politics, in which the arrival of Anthropocene is often translated into pragmatic possibilities for action. Scholars in this context<sup>18</sup> have effectively exited the “everything neoliberal” dialogue by focusing on imagining everyday alternatives or “whatever action”<sup>19</sup> at the arrival of Anthropocene. The uncertainty is finally accepted as a part of living reality, which then leads to a courage to take actions that are possible for here and now—actually becoming comfortable with not-knowing what will come next: “Precarity means not being able to plan. But it also stimulates noticing, as one works with what is available”.<sup>20</sup> “Scales” in this context are not only just subject to neoliberal social relations, but also perform as important boundaries in which political actions can be mobilised—which can be understood as a transition *from* passive understanding of scale (as an analytical category) *towards* more affirmative understanding of scale (as an entity of action). This article aims to recognise such shift in the literature; going further, it also aims to provide a more concrete theoretical framework through which scales can be theorised as an active source of enacting affirmative environment politics.

## **The Scale Problem in Environmental Governance**

The limits of national scale in tackling climate governance have been well noted by the environmental politics literature.<sup>21</sup> The gist of this literature underlines (1) a “spillover” problem of biodiversity, where the mismatch between ecosystem boundaries and political boundaries necessitates collaboration across different localities and (2) a “tragedy of the commons” situation in which each state’s selfish pursuit of its national interest can ultimately doom the entire planetary ecosystem. These two main issues render environmental governance a “collective action problem”<sup>22</sup> where the accountability, or who should be responsible for taking action, cannot be limited to specific borders or boundaries—which is precisely what makes “the environment” a difficult object of governance.

Identifying the scale of political action to tackle planetary environmental degradation is a highly contested issue; no one can truly have the final say in defining its physical/territorial boundaries, because it is simultaneously local and planetary. Who can really say the real reason, or the root cause, of flash flooding in Paris or severe droughts in Cape Town? We can blame the world, the global, and everyone and every decision related to global warming, especially the countries with advanced economies that have been major perpetrators of climate change, but we can also blame regional and local governments, for their inability to engage with these issues earlier—because they are the ones who can bring about concrete changes with immediate regulatory measures. When the source of the problem is unclear—as we see in environmental governance, where local actions are intrinsically connected to the functioning of the planetary ecosystem (and not exclusively confined to its territorial limits)—the arena for political action (i.e. its boundary or scale) can never be definitely fixed and is continuously reshuffled and redefined, oftentimes between the local and the global. Local, because the common territorial condition—which is explicitly and concretely attached to the everyday lives of the population—is indeed a source of political solidarity and action.<sup>23</sup> Global, because in the end, we all acknowledge that what we are experiencing locally is fundamentally and inevitably related to the planetary environmental degradation, which requires us to behave as a part of “the whole” (i.e. the earthly ecosystem). Environmental governance is one of the specific occasions in which a political issue does not correspond with its territorial boundary, causing states (as a scale of political action) to lose their legitimacy to govern.<sup>24</sup>

This situation is well articulated by Dyer (2014), who coined the term “climate anarchy”, underlining the states’ inability to cope with climate issues effectively (e.g. states’ failure to reach an inter-state agreement on carbon emission reduction targets).<sup>25</sup> Climate anarchy refers to “a divergence from established mechanism of global governance”, a new (dis)order that poses a “challenge to national governmental perspectives on world politics” (p. 182). The tension between ecological responsibility and territorial jurisdictions<sup>26</sup> lies at the heart of this anarchy, resulting in the collapse of a state-driven governance logic: sovereignty. “[C]limate anarchy emphasises human survival and ecosystem stability”, Dyer notes, and “[s]overeignty, even territoriality in a literal sense, will be difficult to maintain under conditions of climate change” (p. 187). However, despite the potential negative connotation of the word “anarchy”, climate anarchy, according to Dyer, is an opportunity for new social coordination and action, rather than a source of paralysis: “[i]t is a positive and creative anarchy rather than the negative and defensive anarchy” (p. 188), where the agency and initiatives of local/municipal governments can flourish in the absence of state-level action. For instance, local governments—through transnational municipal networks, such as ICLEI,<sup>27</sup> the Climate Leadership Group (C40), and EUROCITIES—are now taking matters into their own hands, without waiting for states or inter-state agreement.<sup>28</sup>

Such frustration around the state’s inability and the subsequently emerging landscape of local leadership—is essentially tied to the increasingly popular proposition of “down-to-earth” ecopolitics,<sup>29</sup> which highlights how our empirical relationship with our immediate surroundings and environment should be the driving force behind any pro-nature initiative. The fundamental limitation of state-driven environmental politics comes from the fact that “nature” or “the environment” becomes an abstract concept (as opposed to a physically concrete local problem) that leads to ideological debates—often ending up as a “left or right” partisan issue.<sup>30</sup> The recent federal election in Australia revealed this particular symptom<sup>31</sup> in which the state-driven pro-nature argument, devoid of any empirical local experiences, fails to forge a true sense of connection between our everyday living and the environment. It is not an exaggeration to say that pro-ecology movements are often dismissed as an idealistically normative, or “too radical” argument that only makes sense within the left-wing political propositions, while in fact the matters of the environment affect all of us without discrimination.

While the limits of state-level action are well noted, and the rise of new localism in global climate politics is now evident,<sup>32</sup> it is still unclear what “scale” should be identified as the

most appropriate range for mobilising political action, especially in terms of which scale should be accountable or responsible for tackling environmental degradation. Currently, the general agreement is that it should be (1) simultaneously local and global and (2) not fixed to a territorial boundary and yet with a concrete political entity for action (e.g. municipal governments). This conundrum of “beyond territorial” (and thus global/planetary) versus “realistically located somewhere” (and thus local) is the most critical problem that I identify in theorising scales of political action. I explain this as the clash between two theoretical issues: the “ever-expanding” and “ever-narrowing” notions of scale.

## **Ever-Expanding Versus Ever-Narrowing Notions of Scale**

### ***Ever-Expanding Notion of Scale***

What we can learn from the latest developments in politics of scale literature<sup>33</sup>—related to other poststructural efforts to dismantle *a priori* categories—is that scale is a social construct, and therefore we need to pay attention to how it is constructed through repeated sociopolitical processes.<sup>34</sup> Despite those processes being almost always subject to neoliberal social relations, we can also extend this idea in a different direction: precisely because scale is something that is constructed, it can also be *undone* by new practices. The question, then, becomes not merely about the meta-purposes and intentions of neoliberal social order but more about how we can constitute a “positive reconfiguration of scale” that is not confined to essentialistic labelling or categorisation.<sup>35</sup>

For that very reason, in the context of global environmental politics and governance, the actor network theory (ANT) approach to scale seems to be taking hold as a new way to acknowledge the agency of localities,<sup>36</sup> following the poststructuralist tradition of the politics of scale discourse.<sup>37</sup> Because the politics of scale literature has educated us on how scales are constructed and thus how “spatiality is not synonymous with one which is territorially bound”, we can now study how localities and subnational governments (e.g. cities) can engage with new political spaces that move beyond their territorial spatialities of governing and regulation.<sup>38</sup> Such an emancipatory reading of the politics of scale is possible in the perspective of network theory governance,<sup>39</sup> which underlines how social networks, developed well beyond territorial constraints, can be influential for governance at all scales, acknowledging the roles and initiatives of nonhierarchical actors at play. For instance, Bulkeley (2005)’s example of the Cities for Climate Protection programme was the epitome



of an affirmative “glocal” governance in that *local* authorities can initiate and play a central role in tackling an environmental problem, which is inevitably an object of *global* governance. Acuto (2013a)’s example of the C40 follows a similar narrative, where cities have “a key stake in creating alternative paths for international policy making” (p. 851), which is well exemplified in the context of environmental politics. With a network theory approach to governance, cities are not only being liberated from the constraints of national politics, constitutional barriers, and state bureaucracy but also creating and reconfiguring “spaces of engagement”<sup>40</sup> through which local institutions and practices can influence global environment governance on their own.

However, while network theory provided an effective way to free scales from the pre-existing, territorial structure, a radical extension of this logic can also be problematic due to its inability to draw realistic boundaries, defining the extent to which an entity or an acting agency does not lose touch with the issues and interests that are explicitly territorial. The cosmopolitan, or post-territorial, political subject, in its radical pursuit of freedom from any political framework, often finds itself deprived of *territorial relevancy*, a focal point around which a collective solidarity can be constituted.<sup>41</sup> The scholars working on new localism in environmental governance (e.g. “cities as climate leaders”) are essentially positioning their scale or boundaries of political mobilisation within each municipal government or city-region (which eventually becomes “global” via their linking up with one another), and yet they often do so without a careful inquiry into or articulation of the territorial relevancy or material reality of scale. The critique of network theory and its constructivist/relational understanding of scale has always existed, especially from those scholars working through the ecological aspects of scale—which cannot lose territorial relevancy precisely due to the ecosystem functions that are *materially situated*. The scale of ecological functions, or the operational scale of ecosystems, is inevitably territorial, going from a smaller-scale territory (up to  $10^6$  m<sup>2</sup>), where in seeding and tree replacement occurs, and slowly shifting toward a larger-scale territory (up to  $10^9$  m<sup>2</sup>), where disturbance regimes and long-term climate change occur.<sup>42</sup> The ultimate quest for ecologists is to ask “which scale” should be accountable for its actions and “to what extent”: “[h]ow can we measure the contributions of a particular region, or city, or smokestack, to global climate change?”<sup>43</sup> Similarly, Manson (2008) also called for more attention to a “realist” understanding of scale; arguments over who should reduce carbon emissions cannot escape the question of the material impacts of each scalar element, in order to emphasise the culpability of certain localities.<sup>44</sup>

Hence, the adoption of a network theory governance model, despite its empowering and constructive reinterpretation of the existing “politics of scale” dialogue, can be problematised for its lack of acknowledgement of the territorial relevance or materially situated aspects of scale. This results in an ever-expanding notion of scale, where scholars—especially those who focus on the relational understanding of scale—often fail to theorise scales as the boundaries or ranges within which a political action (i.e. a collective expression of interests/purpose in the public sphere) can be initiated and mobilised. In the context of environmental governance, it is easy to imagine that the policy actions or pro-environmental movements are more likely to occur in places where populations have physically experienced the impacts of global warming (e.g. tornadoes or extreme climate irregularities) or other environmental issues resulting from human interventions (e.g. pollution, decreased water/air quality). Several researchers have noted that public perceptions of climate change are influenced by people’s physical experience of extreme climate irregularities and thus that these events can become catalysts or windows of opportunity to build support for policy action.<sup>45</sup> In fact, the concrete examples of scales in environmental politics, or the actual functioning of scales in environmental governance, cannot escape the discussion of territorial relevancy, especially concerning the initiation of a collective/political action.<sup>46</sup> The nongovernmental organisations’ ecological movements, such as “Earthjustice”,<sup>47</sup> were *fuelled* by an environmental problem specific to the territory (California), which created a moment of “shared reality” or shared territorial condition that ignited a political movement and collective action. Such territorial aspects of scale are evident in the legitimisation of a political action: Earthjustice argues that environmental hazards, in particular, are best addressed “at the scale where their effects are felt most”.<sup>48</sup>

### ***Ever-Narrowing Notion of Scale***

Precisely in relation to Earthjustice’s argument that political actions are best mobilised at the scale where the effects of environmental degradation are felt most, the “down-to-earth” approach to ecopolitics has increasingly come into fashion, especially led by the affirmative Anthropocene literature.<sup>49</sup> This trend is best captured by scholars such as Chandler (2018b; 2019)<sup>50</sup> and Bagues-Pedreny and Schmidt (2019),<sup>51</sup> who provided a synthetic account of the origin and implications of the relevant literature. Their discussions mainly concern how these affirmative Anthropocene writers try to imagine and constitute “affirmative environment politics” in an era where everything seems to be falling apart, since it might sound

superficially counterintuitive to think that one can still remain *motivated* to act when there is nothing one can do to “fix” the situation.

The “down-to-earth” approach to ecopolitics is born from the affirmative Anthropocene literature, partly as a fundamental critique on “the Moderns”, who have lost touch with the Earth while chasing after the stars (i.e. the pursuit of indefinite “progress”), and partly as a grand comeback of empiricist pragmatism that prioritises sensibility and bodily experience with one’s own surroundings. This return of empiricism, they argue, is effectively triggered by extreme climate events and natural disasters, which now command us to “pay attention”<sup>52</sup> to our surroundings, to listen to and feel the feedback from nature. The novelty of this down-to-earth approach lies in this argument that what we do “for the environment” should not be considered a global order to be mindlessly followed; the logic of *why* we do it is fundamentally derived from our everyday *experiences* and *senses* of our immediate surroundings, or the territory where we belong.

Being sensitive to our surroundings and response-able to what nature tries to tell us is the main message that the affirmative Anthropocene literature tries to convey. When it comes to translating that lesson into the context of *doing* ecopolitics, we encounter the problem of scale, especially with regard to the “localisation” of our political actions. For our “sensibilities” and “empirical experiences” to become a source of collective action for environmental politics, they have to be materially situated somewhere. But to what extent, and within what scale, could they be situated? Could that be an individual household scale that has strongly “felt” the impacts of flooding and so is re-realising its relationship with environment? Or should that be at least a block or neighbourhood scale, for a collective action to become more politically viable in terms of its representation in the public sphere? How can we really “collectively determine” the borders of subunits, in order to give “a realistic vision of our belongings”<sup>53</sup>? Affirmative Anthropocene writers’ frequent mention of “feedback loops” may imply that the boundaries of these scales should be based around ecosystem functions;<sup>54</sup> however, whether that is to be done to the extent that the existing geopolitical boundaries have to be completely discarded is unclear, and this is perhaps unrealistic in actual political practices.<sup>55</sup> Furthermore, the idea of collectively deciding the boundaries of a territory—through discussions amongst the locals who believe they belong to a certain territory—remains theoretical or practically naive, since, in reality, it would mean that the scale of these territories should remain *small enough for direct democracy to be operationalised*. In fact, the success stories of place-based environmental politics—which are

driven by the empirical experiences of inhabitants and their contextually competent knowledges—seem to exist only within a scale in which direct democracy can properly function.<sup>56</sup> Furthermore, the concrete examples of down-to-earth environmental initiatives are often “micro-projects” that are limited to a very small geographical scale.<sup>57</sup> Similarly, UNDP’s development practices now centre on the projects that are “located at a very local, very immediate and everyday level”.<sup>58</sup> This, I find, is the critical problem of the *ever-narrowing* notion of scale that the affirmative Anthropocene literature faces, especially in its ardent defence of *relocalising* environmental politics.

The ever-narrowing notion of scale can be problematic, as noted by early geographers’ work on the politics of scale. The most featured problem is the “local trap”,<sup>59</sup> where small is not always beautiful or intrinsically “good”. Small-scale, or “bottom-up”, direct democracy practices—often executed at a neighbourhood level—can bring about consequences that are negative at a larger scale, especially if the decisions are inconsiderate toward other neighbouring communities. Consider the “not in my backyard” (NIMBY) phenomenon: a small-scale group decision, despite its process being perfectly democratic and ethical at that level, can have unintended outcomes that can be detrimental to the entire community at a larger scale. This is especially problematic in the context of environment governance.<sup>60</sup> The failure to see the *long-term* consequences of our actions, trapped in the bubble of a small world that we can physically grasp, was probably the main reason that we created this problem in the first place. Not being able to see the connectedness, or how our decisions might directly impact the larger-scale system (e.g. ecosystem) in the long term, was the failure of modernist, silo-framed thinking that was unable to address the holistic challenges of environmental issues. In other words, affirmative ecopolitics’ emphasis on relocalising environmental politics—how our motivation for “protecting nature” should be driven by our attentive care for our immediate surroundings, or empirical experience of our world—is certainly an important contribution; however, when it comes to applying that lesson to environmental politics in practice, its theoretical perception of the local scale rarely reaches beyond local-fetishism (“small is beautiful”), often failing to address systemic issues at a larger scale.

## **Theorising Scales of Political Action in the Anthropocene**

The debates between the ever-expanding and ever-narrowing notions of scale demonstrate how difficult it is to frame scales in the context of addressing environmental degradation, whose cause and impacts are simultaneously both local and planetary. So the main question is: How can scales—as ranges in which a collective, political action can be mobilised—be simultaneously local and global? We should not think of scales as fixed or trapped within predetermined scalar structures, especially when environmental issues “leak” or “spill over” geopolitical boundaries. Yet, at the same time, we should also acknowledge that the source of any political action cannot be entirely free from territorial relevancy, specifically in the context of environmental politics where the spatial and material aspects of ecosystems’ scales should be considered. At first glance, this seems to be an unresolvable dilemma; meeting both conditions—local and global—sounds self-contradictory and improbable. However, I argue that scales of political action, especially in the context of environmental governance in the Anthropocene, can be both materially situated and global, if a careful theorisation of such a scale can be articulated—which has been missing in the current literature on the politics of scale. To construct this argument, I use theoretical insights from Gaian ecopolitics and complex theory to establish three characteristics that should be considered when discussing the scales of political action in the Anthropocene. The three characteristics of “scales of political action” are: (1) they are materially situated, or subject to their territorial conditions which helps a formation of solidarity based on collective empirical experiences; (2) they possess a degree of intensity that allows them to be influential across different scales (e.g. scale jumping); (3) they are large enough to retain a degree of complexity that renders them to account for interaction effects.

### ***Characteristic 1: Scales of Political Action are Materially Situated (i.e. Subject to Their Territorial Conditions)***

Scales of political action are materially situated or subject to their specific territorial conditions, however such “materially realistic” aspect does not negate the “globality” of scales. In order to explain how scales can be both materially situated and global at the same time, I would like to introduce a theoretical standpoint proposed by the “down-to-earth” ecopolitics—which interprets “global” as *ubiquitous*. In essence, the down-to-earth/new materialist ecopolitics writers argue that nature is “global” *not because* it can be summed up into a one, graspable globe (like the one we have in our offices), *but because* it exists everywhere in a ubiquitous manner that is inseparable from our everyday life (like the air we

breathe). Let me discuss in a little more detail on why this theoretical standpoint is so critical for the rise of down-to-earth/new materialist ecopolitics.

The real point of departure for down-to-earth ecopolitics writers—from the same old “sustainability” politics—is their way of questioning “nature” as an abstract figure entirely detached from our everyday socio-economic issues. Latour (1999, 2017a)<sup>61</sup> has claimed that the very first thing we should do to revolutionise our approach to environmental politics is to *secularise* the notion of one, holy *Nature*. For a long time, nature, or what we commonly refer as the “environment”, has been considered something that exists external to us that should be studied by objective, scientific laboratories and completely separated from our daily activities. In this framework, what humans do for nature is a chivalric act of benevolence that has nothing to do with our everyday lives. A perfect example of this approach is setting up a series of “greenbelt” areas (as our “service” to nature) while still maintaining the same polluting lifestyles and interventions that disregard ecosystem functions (e.g. use of plastic bags, unsustainable waste management). The end result of this approach is a default perception that the environment is external to our daily activities, and we are completely oblivious to the fact that our material existence is entirely dependent on what we are provided by the ecosystem. Therefore, what we have to do, to move beyond the “sustainability” politics that consider environmental friendliness a tertiary option, is to discard this notion of *Nature* and the environment that has been externalised from the core functions of our socioeconomic activities.

For us to avoid confusing the secular version of nature with *Nature*, we needed a new name for the former, which is now being referred to as “Gaia”.<sup>62</sup> What differentiates Gaia from our conventional notion of nature is that it does not belong to the world of scientific labs and microscopes, where identifying the “true” version is often taken for granted. When it comes to Gaia, there is more than one true, objective version or perfect representation. Gaia is the “localised, historical, secular avatars of Nature”<sup>63</sup> that are intrinsically plural, as plural as our actual experiences of the world—despite its being shared by all of us, the way it is experienced varies across different collectives inhabiting different territorial realities. As opposed to *Nature*, which can be perfectly summed up in a single entity via unilateral consensus from scientists (as guardians of “truth”), Gaia is continuously disputed and can never be moulded into a single comprehensive being, because Gaia is an actual habitat where people live rather than an object to be studied. It exists through divergent “situated

knowledges”<sup>64</sup> that are a product of lived experiences—which differ depending on where they are physically located, or the territorial conditions within which they occur.

This in fact inspires a new interpretation of what we actually mean by “global”. The word is often perceived in conjunction with the image of the globe, an all-inclusive object subsumed into a shape of sphere. This image of the globe essentially follows the reductionist logic that a “bird’s-eye view” can offer a good representation of “truth”. *Nature*, as noted above, has been perceived the same way; it is often believed to have an ultimately “true” version, which could be grasped comprehensively via an objective, all-knowing eye.<sup>65</sup> What down-to-earth ecopolitics is trying to demonstrate is that nature is not “global” because it can be summed up into an ultimate sphere; rather, nature is global because it is everywhere in the sense of *ubiquitous*—permeated into every second of our daily functioning. Think of digital networks and technologies, which are often examples of what it is to be ubiquitous; they are global in that they are everywhere, *internalised* into every second of our daily activities—which is different from the idea of “global” meaning reduced to a single, objective entity (the globe). Accordingly, the “globality”, or “universality”, of nature does not come from the fact that it can be observed by a supreme eye as a holy, complete system; rather, it derives from nature’s *being present everywhere*, from its existence being so deeply infiltrated or seeping into every moment of our lives to the point that it is essentially inseparable from us—like the air we breathe and the water we absorb.

Reinterpreting the “global” this way maintains the logical consistency of what is seemingly a self-contradictory statement: “the most local experience is the most planetary experience”. Precisely because the universality of nature is sustained by its ubiquitous presence—rather than the objective “truth”—the qualitative, in-depth experience at a specific location can be a valid representation of our relationship with nature. For instance, those who cultivate a close relationship with nature via gardening in the backyard can probably produce a very good narrative of how the ecosystem functions on their land, which is as valid as what a scientist or chemist can “objectively” explain. It is not surprising, then, that there have been various collaborations wherein different localities share and learn from their unique experiences with nature (e.g. impacts of climate change or natural disasters) even though each of their experiences is subject to their specific territorial conditions. For instance, the transnational experience-sharing networks, such as *100 Resilient Cities*, transmit exemplary or flagship local initiatives, from which cities try to learn from one another how to navigate common environmental challenges. This learning effort, especially in the context of tackling

environmental issues, works well despite each instance having inherent territorial specificities—because they all concern learning to interact with nature, which is present everywhere and in every moment of our lives and is an essential part of being a “human” (can we even imagine a second without oxygen?). A logical flaw in the human-centric interpretation of Darwinian evolution—which might conclude that “humans” are here on their own merit—is that it is simply not possible to separate the human from nature;<sup>66</sup> humans are a material product of mobilised micro-organisms, and if there can be anything essential about human life, it would be nurturing a relationship with nature, from which we are constituted. As a Zadist<sup>67</sup> slogan says, “we do not defend nature, we are the nature which defends itself”.<sup>68</sup>

In Gaian ecopolitics, the “materially situated-ness” of a political action does not contradict the idea of going global; in fact, the more situated an action is, the deeper and more concrete its experience is, which makes it even more “representative” or valid in explaining how our relationship with nature works in reality—whose ubiquitous presence effectively overrides the need for reductionist, quantitative generality. Gaia is everywhere, and its ubiquity cannot simply be grasped or reduced into a single globe; for this reason, the face of Gaia has to be constituted point by point, feedback loop by feedback loop, *in plural dimensions*—as a collective, “compositionist” effort.<sup>69</sup> Once we let go of the idea of “global” associated with the image of the “globe”, the materially situated (or “territorial”) character of political action is not a stifling chain to escape but an advantage to render us more profound—producing a more valid and perhaps more planetary account of our experience with nature. Such collective empirical experience is in fact indispensable for the formation of solidarity that can enact a political action within the given territory.<sup>70</sup> Following this logic, we can draw the first characteristic of scales of political action in the Anthropocene: they are inevitably territorial, in that they have to be physically located somewhere; however, that does not mean that they will lose global implications—because “global” here signifies a *collage* of ubiquity, rather than a unilaterally wrapped-up comprehensiveness.

***Characteristic 2: Scales of Political Action Possess a Degree of Intensity that Allows them to be Influential Across Different Scales***

Another important characteristic of scales of political action is that they possess a degree of intensity that allows them to be influential across different scales. They have the capacity to “scale-jump” in the sense that it can bypass some hierarchical structures thanks to their



collective concentration of power and resources. Such “scale-jumping” aspect has been evident for the global urbanism literature,<sup>71</sup> which documented the important role of cities in international diplomacy as representatives of agglomerated regions. However, these discussions have not been well connected to the works of scholars trying to reconcile the “constructivist” understandings (adopting from social sciences) and “realist” understandings (adopting from ecology/environmental sciences) of scale especially in the context of environmental action.<sup>72</sup> Scholars such as Sayre (2005), Manson (2008) and Neumann (2008) have been trying to resolve the mismatch between political and ecological scales, and they have been largely inspired by complex theory in advancing “politics of scale” discussions in environment politics. As a continuation of this dialogue, I demonstrate below how complex theory can help us theorise scales of political action as simultaneously both “local” and “global”.

Above all, complex theory emphasises the *nonlinearity* of scalar effects, pointing out the cases in which the effects at a lower-level scale do not automatically add up to the effects viewed from a higher-level scale; this thesis is based on the argument that “a collection of small-scale observations are *not* predictive of larger-scale outcomes” (e.g. butterfly effects).<sup>73</sup> What happens at a small scale cannot necessarily be extrapolated up, and vice versa, because results are nonlinear across scales.<sup>74</sup> This aspect of nonlinearity noted by complex theory is useful for understanding how scales of political action can be theorised to be simultaneously local and global. What was intended to be local cannot always remain so, as its impacts can influence larger-scale functions in a way that is not necessarily calculable or predictable. As Cox (1998)<sup>75</sup> noted two decades ago, the “territoriality” of a local action cannot be confined to its geographical boundary, due to the connectivity amongst the locals that amplify the intensity of their impacts: “the world is far more complicated than an easy equation of state-defined territorial scales ... Local governments may form part of networks that bring together not just local interests but agents which have a degree of locational discretion between one local government jurisdiction and another” (pp. 20–21).

Similarly, Manson (2008)<sup>76</sup> also argued that complex theory can help understand how “a local action may directly affect those at a larger scale *without* moving through intermediary scales” (p. 9, emphasis added). For instance, social movements/protests against environmental damage caused by globalisation (or the global unfolding of the capitalist economy) can create international coalitions that bypass regional or national scales and leap onto the global stage.<sup>77</sup> Furthermore, with the ever-improving communication technologies

and resulting global connectivity, a wide mediatisation of “local” events—such as tsunamis in Tohoku, earthquakes in Christchurch, or hurricanes in Florida—can easily influence policy agendas globally.<sup>78</sup> In short, depending on the intensity of an action, what was executed at a smaller scale can lead to exponential effects at a larger scale, even though the initial action was physically located within a particular territory.

The condition that allows scales to be simultaneously both local and global is *the degree of intensity*. The effectiveness of an initiative does not depend on its geographical scale but on its ability to spread out its impacts by creating coalitions and partnerships. The network theory understanding of city climate leadership<sup>79</sup> clearly becomes relevant here, not merely because it acknowledges cities’ agency (that bypasses national political scales) but because these transnational coalitions can *intensify* the impacts of local actions by connecting with one another. If cities are to be the leaders of political actions against global environmental degradation, this becomes possible via creating networks and avenues for working together (Davidson et al., 2019)—precisely because, by doing so, they can enhance the impacts of their actions. There is ample evidence of such phenomena where a local action spirals into a global movement due to its intensity, quantitatively or qualitatively defined.<sup>80</sup> Hence, the second characteristic of scales of political action that are simultaneously materially situated and global is that they should possess a certain degree of intensity that can augment the influence of their actions (and produce impacts at a larger scale), which is often effectively done via linking with other peer scalar entities.

***Characteristic 3: Scales of Political Action are Large Enough to Retain a Degree of Complexity that Renders them to Account for Interaction Effects***

Scales of political actions are large enough to retain a degree of complexity that renders them to account for interaction effects. The nonlinearity or intensity of scalar effects, noted above by complex theory, are in fact closely related to the interaction effects amongst the components that constitute a complex system, as such nonlinearity itself is driven by the “friction”<sup>81</sup> of a series of incidents in the long term. Then the ultimate scale question is: how do we define the “threshold” of *when* (or at which point) such incalculable, unpredictable outcomes spring from a local action—disrupting linear patterns or relationships? Sayre (2008),<sup>82</sup> drawing from complex theory in the field of ecology, argued that a major topic for theorising scale would be defining the “thresholds” or “breakpoints” of nonlinear or qualitative change across scales (in complex systems). The threshold problem is born from a

practical need in ecological research, especially in terms of the moment at which a concrete action should be taken: “at what concentration does a contaminant become dangerous to humans or other organisms? How much habitat loss will result in extinction of a species?”<sup>83</sup> Most importantly, the idea of thresholds accounts for the *time scale*, to underline the interaction effects amongst constituents that occur *over time*. Once the temporal aspect is factored in, we are bound to think more about the changes and evolutionary aspect of scalar effects and how they are shaped by the *interactions* amongst the agencies located within each scale. What makes it especially challenging to determine thresholds is that these changes are often nonlinear, abrupt, or sudden, which is hard to predict or calculate through statistical correlations.

The concept of “threshold”—where interactions amongst the parts result in a qualitative change whose effects reach beyond the designated scale—certainly helps in theorising the scale of political action in the Anthropocene, where we are often required to define which scale should be considered responsible for pro-environmental initiatives. For instance, a collection of LEED<sup>84</sup>-certified “green” buildings does not automatically qualify as an “ecological neighbourhood”,<sup>85</sup> in which the utilities, water, and waste management would be orchestrated in conjunction to reduce ecological footprints at a neighbourhood scale. Similarly, a collection of several ecological neighbourhoods cannot automatically become a “resilient city”, because a resilient city has to reflect on the relationships and interdependencies across different neighbourhoods and their roles and functions within the city scale that influence cumulative environmental impacts at a broader level (e.g. transportation, industrial exchanges, land use allocations). Here, the geographical thresholds are assumed to be “neighbourhood” and “city”. As interactions between local agencies continue for a certain period, we anticipate unpredictable outcomes that spill over past the agencies’ very local scale: “neighbourhood” is a threshold where the interaction effects amongst buildings can start to be noticed, whereas “city” is a threshold where the interaction effects amongst neighbourhoods can be considered. In fact, the larger the scale, the easier it is to take these interaction effects into account. For instance, cities, compared to neighbourhoods, can attend to the issues that are intrinsically systematic; governing the interaction effects of different neighbourhoods—via organising the energy effectiveness of land use designs or transportation layouts—is better addressed at a larger scale, or a more “scaled-up” perspective.

This can lead to an understanding that the scales of political action, or an appropriate range for an initiative, should have a territorial anchor somewhere and yet still be *large enough* to retain a degree of complexity that allows them to account for interaction effects (which cannot be perceived at a smaller local scale). This mirrors the material aspects of ecological scale, which is tied to some territorial relevancy and causality (e.g. “feedback loops” that respond to human interventions), and yet its complexity still remains, because there will be no perfect mathematical formula that can explain every aspect of how these feedback loops would function in reality—calling for a more holistic, or systematic, approach that oversees different interaction effects amongst the constituents. Accordingly, a scale of political action, specifically in the context of the Anthropocene, should be conceptualised as a unit that is big enough to be a system within itself, where *governing* the complexity of interactions amongst its parts implies more than the collection of simply *managing* those parts. This idea is subject to different interpretations; one can say that an apartment building is a systemic scale in itself, as it implies more than a collection of households because of the building-wide management of interaction effects between households; similarly, a neighbourhood can claim to be a systemic unit, as its governance requires a reflection on interactions amongst the buildings as well as single family homes. Obviously, the question of what should be the most appropriate, operationalisable, or efficient “local” scale for governing environmental issues should be open to debate and discussion, allowing different stories and experiences to unfold. The point, however, is that this aspect of complexity—which requires a qualitative, nonreductionist, holistic approach—should be an integral part of characterising “scales of political action” in the Anthropocene, precisely because an environmental problem, as a product of complexity that is inherent in ecosystem functions, cannot be reduced to a simple calculative logic. Hence, the third characteristic of scales of political action: they are, despite having a territorial anchor, large enough to consider interaction effects that cannot be addressed by scales that are *too* local.

### **Proposition: Cities as Frontiers of Doing Earthly Politics**

Following the three characteristics of scales of political action that I have outlined above, I make a case for why city-regions, or the “urban scale”, are a good choice for doing earthly politics in the era of the Anthropocene. Given that the scales are essentially unfixed entities whose boundaries are contested and contextually dependent, my argument should be considered a proposition rather than a definite imperative. This effort is a response to the increasing discussion of which scale is “good” for addressing environmental issues whose

causes and impacts are intrinsically both local and global. The majority of academic discourses on politics of scale often neglect the operational aspects, and there is an urgent need for propositions on scales as ranges in which a political action can be engaged and activated. In my argument for why cities can be frontiers of doing earthly politics, I touch upon some pragmatic implications of the politics of scale, which can offer insights to applied research without having to adjust its theoretical depth for applicability.

### ***Small Enough to be Graspable***

The first rationale comes from the first characteristic that I highlighted above, especially with regard to Gaian ecopolitics' defence of the "materially situated" character of the local. As I noted in the "ever-narrowing notion of scale" section, a blind belief in "the local" can lead to a local-fetishism that fails to realise why small is not automatically beautiful or ethical—which becomes clearer when we start to zoom out to the "big picture". However, Gaian ecopolitics' theoretical emphasis on the local moves beyond the romanticisation of the local, because it primarily concerns reframing the notion of "nature" *not* as an external object *but* as an internal, localised part of us. Hence Gaian ecopolitics' defence of the local is an argument that what we do "for nature" should be driven and *motivated* by what localities actually experience, whether that is the impacts of climate change (e.g. extreme climate events) or environmental degradation (e.g. pollution) in general. Essentially, it is an attempt to move past environmental politics as a moral obligation, leading toward more democratic or bottom-up initiatives that are informed/triggered by our actual empirical experiences. If it is impossible to sum up what "nature" really is—because it is so inextricably entwined with our everyday activities and experiences—that would also mean that the way we do earthly politics should also be a *collage* of locally driven (or "feedback-loop-based") activities that are tied to territorial anchorage.

Cities are, essentially, materially situated entities that are subject to territorial conditions, in terms of not only their cultural/political contexts but also their environmental conditions and challenges specific to their territory. As per affirmative/Gaian ecopolitics' emphasis on how governance schemes should match the feedback loops and material aspects of scale—to the extent that we can physically experience the repercussions of our actions—cities are, compared to other larger political scales, one of the "graspable" ranges in which a collective action can be mobilised based on those repercussions. For instance, the awareness of climate change can be more widespread in the cities that physically experience the impacts and

consequences of environmental degradation, and it is likely that collective, city-wide policy initiatives can be launched based on those very experiences.<sup>86</sup> This point is in line with the first characteristic of “scales of political action” that I theorised above; their territorial specificities (especially with regard to environmental conditions), in the context of the Anthropocene where the ultimate/true/objective “nature” does not exist, are an advantage to producing more concrete (or qualitatively rich) accounts about our relationship with nature, based on the empirically experienced and thus more “graspable” shared realities.

### ***Intense Enough to be Influential***

My second rationale is connected to the classic “global cities” literature—where cities, as global economic powerhouses and concentrated human settlements, rise as internationally relevant actors.<sup>87</sup> Within this tradition of “why cities matter”, cities should be frontiers of environmental politics for the following reasons. (1) Cities, as sites of production and physical manifestations of the global political economy, have political influence and power in the global stage—and thus their pioneering actions can be models for the remaining localities; (2) Cities, housing concentrated human populations, are responsible for the majority of greenhouse gas emissions—and thus changes in them will bring about more significant positive outcomes; (3) Cities, “the most networked and interconnected of our political associations”,<sup>88</sup> are powerful agencies of the kinds of pragmatic and collaborative politics (that the states cannot achieve)—and thus more equipped to launch more progressive political initiatives, including pro-environment actions. Especially in the context of environmental issues, where nation-states lose the legitimacy to govern and act—since the “root cause” of the problem lies well beyond state boundaries—the rising power of localities in global climate politics makes even more sense. This is certainly in line with the conventional critique of a fixed notion of spatial categories, as the political power and influence of cities definitely exceed their predetermined geographic boundaries. As Doreen Massey highlighted, what makes cities “different” and “crucial” as spatial entities is their character of *intensity*: “Cities are social relations, OK, dead obvious, everything is social relations, so what is different about cities? And what we decided was that the crucial word for us over and over again was *intensity*, that cities were actually intensities, spatial intensities of social relations, compared with less intensive areas which are beyond the cities”.<sup>89</sup> In fact, as noted above, there is also a theoretical explanation for such phenomena in complex theory, where the nonlinearity of scalar effects—produced by the *intensity* of local actions whose

influence exceed the designated material scales—is a key aspect of how complex systems work in reality.

An important continuation of the “global cities” discourse is the changing paradigm of urban architectural innovation in the face of ecological crises. Taking a cue from Turner (2000, 2007)<sup>90</sup>’s work on how built environments are the “extended organisms” for how our bodies function and strive to adapt in the given climate, Downton (2008)<sup>91</sup> argued that cities should also be considered our “adaptive modification” of the environment at the (human) species level—which is subject to its surrounding conditions rendered by the feedback from nature: “[t]he way we envision, design, and fabricate our built environment can be theorised as our efforts to survive and extend our physiology as human species; then, it is logical to derive a conclusion that cities and architecture should be sensitive and responsive to the feedback from nature”.<sup>92</sup> It is the *intensity* of cities as historical centres of human communication and social exchange that qualifies them to be the frontiers or “transformative agencies” of redefining our relationship with nature: “[cities] built environments are the most visible physical manifestations of our role as conscious agents of change ... It is through our cities that we not only act on earth but can best understand that action because our cities are centres of communication and culture. As historical centres of social change, cities are best placed to be primary agents of conscious environmental change’.<sup>93</sup> This new interpretation of the role of built environments effectively establishes another rationale for “why cities matter” arguments in doing earthly politics. If we consider cities to be habitats for human survival—whereby concentrated human populations “adaptively modify flows of matter and energy through the environment”<sup>94</sup>—urban architecture and city-making processes would inevitably be at the heart of leading the kinds of planetary environmental politics that stress a more coexistential relationship with ecosystems.

### ***Large Enough to be Complex***

The final rationale is based on the notion that the appropriate scale should be *large enough* to oversee the interaction effects and produce the kinds of interventions that can address these effects—which cause unpredictable and sudden outcomes that cannot simply perceived within the scope of “too small” scales. The arrival of the Anthropocene marks our increasing attention on the unpredictability and uncontrollability of how nature (finally) responds to our actions, which has now become ever more visible with extreme climate irregularities and natural hazards events. What these events cause us to realise anew is the precarity of human

material existence and the limits of our human-centric, short-term “problem-solving” approaches that ultimately prevent us from developing a more sustainable, coexistential relationship with nature. In this context, the increasing attention paid to complex theory and its emphasis on the unpredictability and nonlinearity of scalar effects become highly relevant, as it guides us beyond short-term, fragmented thinking toward more holistic, systematic thinking. Especially in dealing with natural disasters and their unpredictability, scholars have called for the need for more “scaled-up” perspectives with which governance approaches can be more systematic and coherent.<sup>95</sup> Such approaches include considering ecosystem dynamics in stormwater management and land use designs in flood-prone area developments.<sup>96</sup>

Cities, packed with diversity and a multiplicity of social and historical layers, are complex systems within which a variety of agencies and their interactive relations come into play.<sup>97</sup> As a host of different kinds of populations, in terms of cultural, economic, and vocational status, cities constantly strive to balance conservation and progress, protection and inclusiveness, and resource allocation and pursuit of innovation. There is no simple solution to these problems, given that it is never really possible to fully represent and address divergent interests and concerns that often clash. Governing this multiplicity requires approaches that are *sensitive* to the complexities and unpredictable events, essentially caused by the reality of divergent agencies and interactions amongst them. For this very reason, city governments are bound to think through the unintended consequences that local decisions can bring about, being attentive to the interconnectivity of the parts and the long-term effects of local decisions on the city as a whole. I argue that this orientation of city governance is generally advantageous for pioneering a more sustainable relationship between human settlements and ecosystem functions. Scholars such as Wilson (2006, 2014)<sup>98</sup> have noted how the complexity and nonlinearity of *urban* systems can inspire novel ways of interpreting complex ecosystems: “urban systems have contributed significantly to complexity theory in the past—because they are complicated enough to be interesting but simple enough to be solvable”.<sup>99</sup>

Compared to neighbourhood or village-level scales, cities are larger systems that are better equipped (in terms of being “large enough”) to observe the outcomes that result from interaction effects that cannot be identified within smaller scales: “[t]o define the city one must look for its organising nucleus, trace its boundaries, follow its social lines of force”.<sup>100</sup> Environmental issues are more likely to face the dilemma of the “local trap”—where locally made decisions have negative impacts on larger-scale operations—because



ecosystem functions usually cannot be divided into smaller geographic boundaries. Furthermore, as noted above, cities can also offer more holistic solutions that can more systematically reduce our ecological footprints; designing a city-region-wide transportation network to better connect different suburbs and neighbourhoods can cut down on individual car use and carbon emissions, perhaps more effectively than the “small wins”, such as turning parking lots into green spaces.

## **Conclusion**

The main purpose of this article is to theorise scales of political action in the Anthropocene, with regard to who should be responsible for addressing planetary environmental degradation. The major challenge I have embarked on, and now invite everyone to join in tackling, is setting up a transformative reconfiguration of scales for political action. For a long time, scales have been considered passive entities subject to the global power/influence of neoliberalism; they act, perform, but only in the service of naturalising the capitalist social order. However, this notion of invincible neoliberalism is now being challenged, perhaps more effectively by the affirmative Anthropocene literature, which regards the fragility of our material existence, underlined by the unpredictability of natural disasters, as an opportunity to rethink and reframe our relationship with nature. In this context, proposing a positive reconfiguration of scale is needed more than ever, especially for the environmental issues that are intrinsically both local and global. Continuing in the tradition of the work of Bulkeley (2005; 2013) and Acuto (2013a) on how local initiatives, in collaboration with one another, can influence the global, I aimed to provide a theoretical framework that underlines the theoretical characteristics of those “locals”. This work is a preliminary effort to become more theoretically engaged with the political concept of “scale”, which I believe should be reflected upon *before* claiming why certain scales (e.g. neighbourhoods, villages, or cities) should be the “leaders” in tackling the planet-wide environmental degradation. Accordingly, I invite other propositions and discussions on the question of which scale should be responsible, or, more practically, operationalisable, for governing environmental issues whose causes and impacts are intrinsically both materially situated and planetary. Given the historical arguments on why a “fixed” notion of scales is not quite adequate, it is a theoretically challenging work. However, proposing and debating on scales as entities for

political action can have important practical and policy implications—that are urgently needed to activate our collective will to reframe and reestablish our relationship with nature.

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54.

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The concept of “Gaia” originates from “Gaia Hypothesis” by Lovelock (1979), which emphasised that nature is a living, active organism rather than an inanimate object or background to be passively exploited; James Lovelock, *Gaia: A New Look at Life on Earth* (Oxford: Oxford University Press, 1979).

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LEED stands for “Leadership in Energy and Environmental Design”, an international green building rating system.

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The ecological neighbourhood model is well captured in “*écoquartiers*” in the Parisian region (e.g., Ile-Saint-Denis’ *écoquartier fluvial* and the Gare Ardoine area’s *écoquartier résilient*), where the spatial organisation of a particular group of blocks is specifically designed and arranged such that their functions are in accordance with ecological processes (especially for water management).

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