Urban Political Ecology. Great Promises, Deadlock… and New Beginnings?

Erik Swyngedouw
Maria Kaika
The University of Manchester. School of Environment, Education and Development
erik.swyngedouw@manchester.ac.uk
maria.kaika@manchester.ac.uk

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Abstract

The paper starts from the premise that it is vitally important to recognize that the rapid rate of planetary urbanization is the main driver of environmental change. Indeed, the 'sustainability' of contemporary urban life (understood as the expanded reproduction of its socio-physical form and functions) is responsible for 80% of the world's use of resources and most of the world's waste. We wish to highlight how these urban origins are routinely ignored in urban theory and practice, and how feeble techno-managerial attempts to produce more 'sustainable' forms of urban living are actually heightening the combined and uneven socio-ecological apocalypse that marks the contemporary dynamics of planetary urbanization. This paper is, therefore, not so much concerned with the question of nature *IN* the city, as it is with the urbanization *OF* nature, understood as the process through which all forms of nature are socially mobilized, economically incorporated and physically metabolized/transformed in order to support the urbanization process. First, we shall chart the strange history of how the relationship between cities and environments has been scripted and imagined over the last century or so. Second, we shall suggest how the environmental question entered urban theory and practice in the late 20th century. And, finally, we shall explore how and why, despite our growing understanding of the relationship between environmental change and urbanization and a consensual focus on the need for 'sustainable' urban development, the environmental conundrum and the pervasive problems it engenders do not show any sign of abating. We shall conclude by briefly charting some of the key intellectual and practical challenges ahead.

Keywords: urban political ecology; environmental politics; urban theory; socio-ecological conflict.

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Resum. *L'ecologia política urbana. Grans promeses, aturades… i nous inicis?*

L'article parteix de la premissa que és de vital importància reconèixer que el principal impulsor dels canvis ambientals ha estat el galopant procés d'urbanització mundial. De fet, la «sostenibilitat» de la vida urbana contemporània —entesa com la reproducció ampliada de la seva forma social i natural i del seu funcionament— és la responsable de l'ús del 80% dels recursos i de la generació de la major part dels residus mundials. Aquest article vol fer palès com aquestes arrels urbanes són habitualment ignorades per gran part de la teoria i la pràctica urbanes, i com els febles intents tecnocràtics per adoptar formes més «sostenibles» de vida urbana en realitat segueixen afavorint l'apocalipsi socioecològica combinada i desigual que marca les dinàmiques contemporànies de la urbanització mundial. Així, no es tracta tant d'analitzar la qüestió de la natura a la ciutat, sinó més aviat d'analitzar la urbanització de la natura (entesa com el procés a través del qual tot tipus de natures són socialment mobilitzades, econòmicament incorporades i físicament metabolitzades/transformades per tal de donar suport al procés d'urbanització). En primer lloc, explicarem com les relacions entre les ciutats i el medi ambient han estat descrites i imaginades al llarg de l'últim segle. En segon lloc, indagarem com la qüestió ambiental va entrar en la teoria i en la pràctica urbana durant el segle xx. Per acabar, esbrinarem com i per què, malgrat l'avenç del nostre coneixement sobre la relació entre el canvi ambiental i la urbanització i un consens focalitzat en la necessitat d'un desenvolupament urbà «sostenible», la incògnita del medi ambient i els problemes generalitzats que ocasiona no mostren cap senyal de disminuir. L'article conclou amb un breu esbós d'alguns dels reptes intel·lectuals i pràctics que ens esperen.

Paraules clau: ecologia política urbana; polítiques ambientals; teoria urbana; conflicte socioecològic.

Resumen. *La ecología política urbana. Grandes promesas, frenos… y ¿nuevos comienzos?*

El artículo parte de la premisa de que es de vital importancia reconocer que el principal impulsor de los cambios ambientales ha sido el galopante proceso de urbanización mundial. De hecho, la «sostenibilidad» de la vida urbana contemporánea —entendida como la reproducción ampliada de su forma social y natural y de su funcionamiento— es la responsable del uso del 80% de los recursos y de la generación de la mayor parte de los residuos mundiales. Este artículo tiene por objetivo resaltar cómo estas raíces urbanas son habitualmente ignoradas por gran parte de la teoría y la práctica urbanas, y cómo los débiles intentos tecnocráticos para adoptar formas más «sostenibles» de vida urbana en realidad siguen favoreciendo el apocalipsis socioecológico combinado y desigual y que marca las dinámicas contemporáneas de la urbanización mundial. De ahí que no se trata tanto de analizar la cuestión de la naturaleza en la ciudad, sino más bien de analizar la urbanización de la naturaleza (entendida como el proceso a través del cual todo tipo de naturalezas son socialmente movilizadas, económicamente incorporadas y físicamente metabolizadas/transformadas en beneficio del proceso de urbanización). En primer lugar, explicaremos cómo las relaciones entre las ciudades y el medio ambiente han sido descritas e imaginadas a lo largo del último siglo. En segundo lugar, indagaremos cómo la cuestión ambiental entró en la teoría y en la práctica urbana durante el siglo xx. Por último, averiguaremos cómo y por qué, a pesar del avance de nuestro conocimiento sobre la relación entre el cambio ambiental y la urbanización y un consenso focalizado en la necesidad de un desarrollo urbano «sostenible», la incógnita del medio ambiente y los problemas generalizados que ocasiona no muestran ninguna señal de disminuir. El artículo concluye con una breve aproximación a algunos de los retos intelectuales y prácticos que nos esperan.

Palabras clave: ecología política urbana; políticas ambientales; teoría urbana; conflicto socioecológico.

Résumé. *Écologie politique urbaine. Grandes promesses, freins … et nouveaux débuts?*

L'article suppose qu'il est essentiel de reconnaître que le principal moteur du changement environnemental a été le lent processus d'urbanisation mondiale. En fait, la «durabilité» de la vie urbaine contemporaine —comprise comme la reproduction élargie de sa forme sociale et naturelle et de son fonctionnement— est responsable de l'utilisation de 80% des ressources et de la production de la plupart des déchets mondiaux. Cet article vise à mettre en évidence la façon dont ces racines urbaines sont généralement ignorées par une partie de la théorie et de la pratique en milieu urbain, et le fait que les faibles tentatives technocratiques qui veulent adopter des formes plus «durables» de vie urbaine ne font plus que favoriser l'apocalypse socioécologique combinée et inégale qui marque les dynamiques contemporaines de l'urbanisation mondiale. Par conséquent, il n'est plus important d'analyser la question de la nature *DANS* la ville, mais plutôt celle de l'urbanisation *DE* la nature (comprise comme le processus par lequel toutes sortes de natures sont mobilisées socialement, économiquement et physiquement métabolisées/transformées au profit de l'urbanisation). En premier lieu, nous expliquerons comment les relations entre les villes et l'environnement ont été décrites et imaginées tout au long du siècle dernier. Nous analysons ensuite la manière dont les questions environnementales sont entrées dans la théorie et la pratique urbaine au xxe siècle. Enfin, nous exposerons comment et pourquoi, en dépit de l'avancement de nos connaissances sur la relation entre les changements environnementaux et l'urbanisation et du consensus qui a pour but un développement urbain «durable», la question de l'environnement et les problèmes généralisés qu'elle comporte ne montre aucun signe de ralentissement. L'article s'achève par une brève référence à certains des défis intellectuels et pratiques qui nous attendent.

Mots-clé: écologie politique urbaine; politique environnementale, théorie urbaine; conflits socioécologiques.

Summary

> Hammer: "If the place isn't hotting up, we're fucked"
> Beard: "Here's the good news. The UN estimates that already a third of a million people a year are dying from climate change. Bangladesh is going down … Methane is pouring out of the Siberian permafrost. There is a meltdown under the Greenland ice sheet … Two years ago we lost forty per cent of the Arctic summer ice … The future has arrived, Toby."
> Hammer: "Yeah, I guess"
> Beard: "Toby, listen. It is a catastrophe. Relax"
>
> Ian McEwan, *Solar* (London: Jonathan Cape, 2010, p. 216-217)

In May 2013, the Mauna Loa Observatory in Hawaii recorded for the first time a concentration of 400 ppm of CO_2 in the atmosphere, thus reaching an emblematic threshold. Such levels of carbon dioxide have not been observed since the dinosaurs roamed the Earth. In 2011, global CO_2 emissions totaled a record 31.6 gigatons and are set to rise to 37.2 gigatons in 2035 (I.E.A., 2012), on track for an average rise of 3.6 degrees Celsius in overall temperatures. Despite two decades of intense debate, successive rounds of fruitless climate negotiations and unrelenting environmental activism, greenhouse gas emissions continue to rise inexorably. According to the head of the International Energy Agency, "the average unit of energy produced today is basically as dirty as it was 20 years ago[1]", and this is set to get worse as 'dirty' energy sources, like tar sands and shale gas, are added to the mix. We have now truly entered what Paul Crutzen tentatively called the Anthropocene, the geological period that follows the Holocene (Crutzen and Stoermer, 2000).

It is vitally important to recognize that rapid planetary urbanization is the main driver of the Anthropocene, and the inexorable increase in fossil energy use and its associated environmental problems. Planetary urbanization not only refers to how most of the world's seven billion people live in cities (a figure set to rise to 70% by 2050), but (more importantly) that a much greater number of people that often do not live in places defined as 'cities' are directly or indirectly involved in ensuring the continuation of the global urbanization process. Indeed, the 'sustainability' of contemporary urban life (understood as the expanded reproduction of its socio-physical form and functions) is responsible for 80% of the world's use of resources (Bulkeley and Betsill, 2005) and most of the world's waste. The ecological condition and the socio-ecological pro blems spurred by accelerating urbanization are indeed making cities the pivotal sites for confronting the environmental conundrum that affects us all. What we wish to highlight in this paper is not the urban origins of environmental conditions, but rather why and how these urban origins are routinely ignored in urban theory and practice, and how the feeble techno-managerial attempts to produce more 'sustainable' forms of urban living (understood in terms of a more benign socio-ecological urban relationship) are actually heightening the combined and uneven socio-ecological apocalypse that marks the contemporary dynamics of planetary urbanization.

From the outset, we do not consider the city to be a heterogeneous assemblage of accumulated socio-natural items and bodies gathered in a densely concentrated space, but a socio-spatial process whose functions are predicated upon ever longer, often globally structured, socio-ecological metabolic flows that not only fuse objects, nature and people together, but do so in socially, ecologically and geographically articulated, but depressingly uneven, manners (Swyngedouw, 1996). We are, therefore, not so much concerned with the question of nature *IN* the city, but rather with the urbanization *OF* nature,

1. According to IEA Executive Director Maria van der Hoeven, <http://www.iea.org/newsroomandevents/pressreleases/2013/april/name,36789,en.html>, accessed 21 December 2013.

i.e. the process through which all types of nature are socially mobilized, economically incorporated (commodified), and physically metabolized/transformed in order to support the urbanization process (Heynen, Kaika and Swyngedouw, 2005). Consider, for example, how the everyday functions of the assumedly de-materialized affective economies that animate much of elite urban social and cultural life (IT networks, social media, smart infrastructural networks and eco-architecture, informatics, and the like) are predicated upon mobilising minerals such as Coltan (columbite–tantalite) in some of the most socio-ecologically vulnerable places on Earth, upon production chains that are shaped by increasingly uneven socio-ecological conditions, and upon a 're-cycling' process that returns much of the e-waste to the socio-ecologically dystopian geographies of Mumbai's or Dhaka's informal suburban wastelands.

In this paper, we shall first chart the strange history of how the relationship between cities and environments has been scripted and imagined over the last century or so. Second, we shall suggest how the environmental question entered urban theory and practice in the late 20th century. And, finally, we shall explore how and why, despite our growing understanding of the relationship between environmental change and urbanization and a consensual focus on the need for 'sustainable' urban development, the environmental conundrum and the pervasive problems it engenders do not show any sign of abating. We shall conclude by briefly charting some of the key intellectual and practical challenges ahead.

The Curious Case of 20th Century Urban Theory and Practice

It is interesting to note that 19th century urban theory and practice was decidedly grounded on a concern with what today would be labelled 'sustainable' urban development. While ecological science was still in its infancy, social theorists and urban engineers were acutely aware of how the urban process constituted a socio-ecological process. Consider, for example, Frederick Engels's vivid analysis of the conditions of the working class in England in the mid 19th century (Engels 1971). He chronicles how the ruthlessly exploitative socio-economic dynamics of capitalist urbanization were paralleled by highly uneven socio-ecological urban conditions. For example, sanitary conditions in working class neighbourhoods resulted in reduced life expectancy and the proliferation of diseases. The ecological niches where poor households were located nurtured a rich ecosystem in which bacteria, rats, bad ventilation, and impoverished bodies lived in symbiotic exchanges that were detrimental for sustaining human life. His intellectual and political peer, Karl Marx, had already explored how socio-natural capitalist metabolism and its associated production of new socio-natural conditions nurtured a metabolic rift between city and countryside, whereby soil exhaustion and socio-ecological decay in the rural domain was the flipside of the accumulation of waste, excrement and unsustainable development in the capitalist

city (Foster, 1999). In the wake of such socio-ecologically disastrous urban conditions, late 19th century urban planners and engineers began to put extraordinary effort into 'cleansing' the city (both socially and physically) through, for example, water and sewage works, ventilation, and the planning of green areas. Consider how British engineer Edwin Chadwick, the founding father of urban eco-infrastructure, laid the foundations for a smart sanitary city *avant-la-lettre* by radically re-engineering the flows of water, waste, and air in the city, while Baron Eugene Haussmann brought light and air (and the bourgeoisie) into central Paris.

While 19th century urban thought and practice were directly related to ecological and environmental relations, the understanding of the urbanization process as a process of urbanizing nature was largely lost in the 20th century. In many ways, 20th century urban thought and practice became strangely de-naturalized. Nature was relegated to the material and discursive domains outside the city and was practically monopolised by technocratic engineering professions. The Chicago School of Urban Ecology, for example, while mobilising ecological signifiers, considered urban dynamics exclusively in terms of social, economic or cultural processes. With a few notable exceptions, like Lewis Mumford and Murray Bookchin, urban thought and practice in times of high modernity was radically severed from its ecological and environmental concerns. Urban eco-technologies were used to produce an 'idealized' environment inside the home by carefully engineering domestic temperature, ventilation, humidity, cleanliness, etc., often with detrimental effects for 'external' socio-ecological conditions (Kaika, 2004).

The post-war hegemony of positivist urban science and engineering further consolidated the view that the urban had severed its ties from nature; that the city could be considered the triumph of the human over the non-human. Consider, for example, how quantitative urban social and economic modelling in the 1950s and 1960s totally evacuated nature from the urban terrain. The hegemony of a de-naturalised urban theory was unfolded precisely at a time when engineers modelled and built the networked infrastructure that permitted the incessant and accelerating movement of all types of nature into, through and out of the city, creating the metabolic vehicles [such as pipes, ducts, cables, canals, (rail)roads, etc.] that sustained large-scale urbanization.

Even the radical urban theories that began to animate urban thought and practice, pioneered by the seminal work by Henry Lefebvre (Lefebvre 1974), Manuel Castells (Castells, 1972) and David Harvey (Harvey, 1973), from the early 1970s onwards, were symptomatically silent about the socio-ecological dynamics that underpinned the capitalist urbanization process or considered how the urbanization process co-produced increasingly problematic socio-ecological conditions. In fact, most radical cultural, social and political urban thought (and practices) that became intellectually hegemonic during the late 20th century were strangely silent about the devastating ecological processes that paralleled a still accelerating urbanization process.

EUREKA!: Ecologizing the Urban

The return to highlighting the urban process as a vital and integral part of the socio-ecological predicament we are in emerged with the increased deterioration of the environment in the 1970s. While the lone voices of earlier visionaries had largely gone unnoticed [see, for example, Bookchin (1992)], in 1969, McHargh's seminal theoretical advocacy of *Design with Nature* gradually inspired the explicit reintroduction of the environmental issue into urban practice (McHarg, 1969). But much more important was the Malthusian clarion call regarding pending resource depletion pioneered by the Club of Rome's *Limits to Growth*, which raised the spectre of immanent scarcity in nature, led the global elites to worry about the allegedly feeble prospects for sustaining capitalist accumulation for much longer, and pinpointed urbanization as the main culprit for the world's accelerating resource depletion (Meadows et al., 1972). In addition, the budding environmental movement, which was particularly active in opposition to the nuclear edifice in the Global North, and to rapidly rising hyper-urbanization in the Global South, propelled environmental matters to the top of the urban policy agenda. The paradigmatic hole in the ozone layer and the subsequent call to undertake urgent action, for example, was largely blamed on CFCs used in domestic appliances.

Urban thought and practice followed suit. Increasingly, urban scholars began to dissect the urbanization of nature as a process of continuous de- and re-territorialisation of metabolic circulatory flows, organized through socially managed physical conduits or networks (Swyngedouw, 2006). These processes were seen to be infused by relations of power and sustained by particular imaginaries of what nature is or should be. Under capitalism, so the argument went, the commodified relationship with nature and its associated transformation and monetary flow suture these socio-ecological processes and turn the city into a metabolic socio-environmental process that stretches from the immediate environment to the remotest corners of the globe (Heynen et al., 2005).

Through this conceptual lens, urbanization is viewed as a process of geographically arranged socio-environmental metabolisms that fuse the social with the physical, producing a 'cyborg' city (Swyngedouw, 1996; Gandy, 2005) with distinct physical forms and incongruous socio-ecological consequences. Recent monographs have substantiated, both empirically and theoretically, how cities and their human and non-human inhabitants across the globe are linked through networks and flows of technology, and social relations of power for the circulation and disposal of water, energy, fat, chemicals, viruses, e-waste (Pellow 2007), household waste (Njeru, 2006), redundant ships (Buerk, 2006; Hillier, 2009), ducts, pipes, cables, and channels (Graham and Marvin, 2001). Gandy's *Concrete and Clay* narrates New York's Urbanization process as a political-ecological construct (Gandy, 2003), Kaika's *City of Flows* considers the cultural, socio-economic and political relations through which urban socio-natural flows are cast and recast during modernity (Kaika, 2005), Swyngedouw's *Social Power and the Urbanization of Nature* explores the rela-

tionship between cities and nature through the lens of water (Swyngedouw, 2004), Desfor and Keil examine the socio-ecological productions that shape Los Angeles and Toronto (Desfor and Keil, 2004). Bakker follows the flow of water through the privatization politics of England and Wales (Bakker, 2003), and Saurí et al. explore the political-ecological dynamics, conflicts and struggles around Barcelona's urban water supply (Masjuan et al., 2008; March and Sauri, 2013). Davis examines the peculiar ecologies of cities that should not be where they are (Davis, 2002). Freidberg's majestic study demonstrates how green beans link African cities to Paris and London (Freidberg, 2004), while William Cronon explores how Chicago became the great city of the U.S. mid-West through incorporating its hinterland 'nature' into the city's metabolic and spatially expanding transformation (Cronon, 1991), Klinenberg shows that heat can be a matter of life or death in contemporary Chicago (Klinenberg, 2002). Brechin narrates how San Francisco's elites rummaged through nature in search of earthly gain and power (Brechin, 2001). Burrowing into the metabolic process of less visible, yet powerfully important socio-natural actants, Ali and Keil map how the SARS epidemic challenged global networks of urban governance (Ali and Keil, 2011), Bulkeley searches for the urban origins of CO_2 (Bulkeley and Betsill, 2005), and Robbins reconstructs the networks of pollution and toxic waste that sustain the 'green' suburban lawn (Robbin, 2007). Other, less dialectical, standpoints claim a greater sensitivity to non-human 'actants', and both critique and complement the above perspectives (Hinchcliffe, 1999; Wolch, Pincetl and Pulido, 2002), adding further insights into what is now a rapidly expanding body of thought.

The above scholars have resolutely debunked the myth that the city is where nature stops and convincingly argued that the urban process has to be theorized, understood and managed as a socio-natural process that goes beyond the technical-managerial mediation of urban socio-ecological relations. By doing so, they helped to delegitimize the dominant 20th century perspectives on the city that ignored nature, without falling into the trap of nature fetishism or ecological determinism. Moreover, by transcending the binary division between nature and society, the urban metabolism perspective has shown that socio-ecological processes are intensely political, and has confirmed that urban theory without nature cannot be but incomplete.

However, this body of thought has paid relatively little attention to the political opportunities such a perspective could bring, or to imagining radically different future urban socio-ecological assemblages. Thus, although we may now be able to trace, chart, follow, and narrate the multiple socio-ecological lines that shape the urban process both locally and globally, precious little has been said about how to produce alternative, more equitable and enabling, urban socio-ecological assemblages. "What is required", Mark Whitehead argues, "is a political methodology of urban nature" (Whitehead, 2003: 280). We shall briefly explore three perspectives that have galvanized thinking and practice around the urban environmental question. The first, urban sustainability, tends to side-line the political-ecological insights summarized above in

favour of a more techno-managerial and ecologically modernizing 'fix' for the environmental condition we are in. In contrast to this, urban environmental justice and urban political ecology open much more politicized and emancipatory modes of intervening in the urban socio-ecological process.

Urban sustainability: the fantasy of socio-ecological urban cohesion

A small library of books has now been assembled around the notion of urban 'sustainability'. Spurred on by the 1987 Brundtland Report and the subsequent 1992 Rio Summit, 'sustainability' became the empty signifier that referred generically to the phantasmagoric vision of a world in which people, the economy and the environment could happily and lovingly interact in mutually supportive, cohesive, and historically reproducible manners, mediated by increasingly 'smart' technologies that would benignly micro-engineer the delicate balance between humans and nature. The term 'sustainability' (which has neither intellectual coherence nor political substance) has now become hegemonically engrained and consensually accepted as the normative ideal that might, with the proper techno-managerial devices in place, not only render our urban ecological predicament bearable but permit civilization as we know it to continue a while longer without engendering significant socio-political change. While there is considerable debate among the multifarious voices that constitute the 'sustainability' edifice, there are a number of underlying assumptions that sustain this vision. First, it is generally accepted that the ecological predicament that the world is in requires serious techno-managerial and institutional change to make sure that the fundamental social and political-economic configuration that we inhabit, i.e. neoliberal globalized capitalism, can continue for a while longer. Second, this vision can be achieved by recognizing the inefficient and ecologically irrational mobilization of the world's natural resources. The development of new smart eco-technologies that are carbon-neutral and resource-efficient, including socio-technical systems that permit the re-use of what was hitherto considered to be excess or waste, point in the right direction for the manufacture of sustainable urban futures. Third, ecological modernization, based on the mobilization of eco-technical rationality, good governance principles, and the internalization of negative externalities within the market logic, becomes the ideological basis around which these principles are articulated. While occasional attention is paid to questions of socio-environmental inequality and injustice, to environmental conflicts, and to the geographically uneven extended networks that sustain particular and place-specific socio-environmental conditions, the sustainability paradigm tends to focus on the techno-managerial complex that might deliver a 'sustainable' urbanity (Krueger and Gibbs, 2007).

Moreover, the implicit and occasionally explicit imaginary of what nature is that underlies much of this discourse is articulated around the myth of a primordial nature that in its original form is inherently harmonious, balanced and dynamically equilibrated, but that (through human intervention) became

out-of-synch, destabilized, ruptured and destructive. The challenge of 'sustainability' is therefore one of restoring the disturbed relationship in order for a harmonious, rationally mediated, society-nature articulation to be re-established and nurtured further. Moreover, the prophylactic qualities of the market offer the appropriate set of mechanisms to achieve this healing process. As such, 'sustainability' has become an imaginary fantasy, literally a utopia, predicated on the possibility of socio-ecological harmony legitimized by an equally fantastical scripting of a particular 'scientific' nature as singular, ordered and inherently dynamically balanced. In doing so, questions of socio-ecological inequality, environmental destruction and its associated power relations are relegated to an issue of effective techno-scientific eco-management (Swyngedouw, 2010).

Much of the 'smart' eco-city discourse and the hype surrounding the greening of urban development through techno-scientific ingenuity are articulated around the above conceptual framework. Eco-cities are perhaps the most exemplary showcases of such green capital investment (Caprotti, 2014). Abu Dhabi's Masdar City is portrayed as the first fully sustainable city and claims to be setting Abu Dhabi on course to being a post-carbon capitalist urbanization, albeit it one that is now in jeopardy as the urban-financial crisis wreaks havoc in this erstwhile capitalist paradise. Nonetheless, the near slave-like working conditions of underpaid Asian immigrants reveal the dark side of this eco-technical utopia. Dongtan, outside Shanghai, was conceived as China's showcase for environmentally friendly eco-urbanization. A project of global scale and importance, designed by eco-warrior architectural consultancy firm ARUP, visualized through wonderful images, commissioned by the Shanghai Industrial Investment Company (SIIC), supported by Tony Blair and later Gordon Brown, promoted by both the Chinese President Hu Jintao and the city's Communist Party leader Chen Liangyu, Dongtan became the iconic lovechild of those who imagined the possibility of a new urbanity based on a new socio-ecological deal, sustained by market-based technological fixes. However, the project has been stalled, while the first steps towards its materialization proved highly controversial. Chen Liangyu now sits in prison over fraudulent land deals, while the SIIC's planning permissions have lapsed, along with the dream for a model global eco-city. Still, the project did confirm Shanghai's roaring success as a world city, attracted the global elite's attention, and propelled it high up the list of cities where a new type of 'sustainable' city-nature assemblages are imagined and possibly turned into real geographies (Kaika and Swyngedouw, 2010).

As 'sustainable development' evolves into a market logic that is opening up new avenues for capital accumulation (Castree, 2008; Himley, 2008), the environmental question has become one that mobilizes diverse political energies around a singular program. Indeed, the urban environmental question helped to form a highly selective 'pluralization' of the state, whereby non-elected officials, experts, and private actors are being incorporated in the governance, delivery and financing of sustainable cities (Swyngedouw, 2009a).

Recent research has criticized these new forms of governance for excessively empowering business elites, for negating issues of democracy and accountability, and for 'naturalizing the political' (Swyngedouw, 2009b). A considerable body of academic literature has also detailed how the new assemblages of money-materialities-governance for managing resources across the urban world retrace the socio-spatial choreographies of the flows of water, waste, food, etc., rearticulate patterns of control and access along class, gender and ethnic lines, and reconfigure maps of entitlement and exclusion. At the other end of the spectrum, however, these same assemblages of capital-natures-cities-people have also given rise to all manner of struggles and contestation (Heynen et al., 2007; Loftus, 2012), ushering in a variety of tactics of resistance and rebellion, and imaginings of alternative urban socio-environmental practices. This is what we shall turn to next.

Urban Environmental Injustice: The distribution of environmental bads

A perspective that has been much more sensitive to the inherently conflicting and power-laden processes of urbanizing nature and the creation of unjust urban socio-environmental conditions through elite-based techno-managerial fixes is that associated with urban environmental justice (UEJ) (Walker 2012). Originating in the United States, urban environmental justice emerged both as a normative concept and a social movement, sustained by newly emerging insights into the highly uneven distribution of environmental 'goods' and 'bads' in the city. Early work in the 1980s had already begun to recognize that poor, often predominantly African American, neighbourhoods were overwhelmingly located in areas that were also characterized by high concentrations of environmentally hazardous conditions. Significant positive correlations were found between the presence of toxic dumps, waste processing facilities, ground pollution, hazardous chemicals, absence of green zones, etc. on the one hand, and concentrations of low-income households on the other. In other words, the spatial distribution of environmental goods and bads mirrored the socio-spatial distribution of wealth and income (Schlosberg, 2007).

Urban environmental justice became defined and understood as a question of Rawlsian distributional justice. The latter is choreographed and structured by the highly uneven political and economic power relations through which decisions regarding the conditions for environmental distribution are made and implemented. While highlighting race, emphasis is put on the ethnically and economically uneven positions in the political and economic decision-making machinery that allocates the distribution of goods and bads throughout the city, revealing that environmental 'goods' are partitioned such that urban elites benefit most while environmental 'bads' are decamped to the areas of the powerless and disenfranchised. It became clear that sustainable urban lives are primarily the privilege of the rich, and sustained by deteriorating socio-ecological conditions elsewhere. While nominally accentuating questions of equality, the emphasis of environmental justice perspectives is clearly

on stressing liberal notions of procedural justice as fairness, and expressing a distinct form of NIMBY-ism (Not in My Back Yard). More recent explorations of urban environmental injustices have extended the earlier focus on race to other social categories such as gender, class, age, ability, and geographical scale, each reflecting distinct forms of unjust urban socio-ecological configurations (Walker, 2009a).

While urban environmental justice is primarily concerned with the procedures through which smart and other environmental technologies, infrastructures and amenities are distributed throughout the city and highlight the highly uneven social pattern of ecological qualities and hazards, this perspective clearly succeeded in socializing nature and ecology by revealing the intricate mechanisms through which nature, ecological processes and socio-environmental conditions in the city are so highly interwoven in such an extremely unjust manner. The latter become etched in the urban landscape through a combination of highly elitist decision-making procedures on the one hand and their cementation into the architecture of eco-technological infrastructures and technologies on the other. Nonetheless, the environmental justice perspective tends to be symptomatically silent about the particular ways in which political forms of power interweave with the particular modalities by which nature is implicated in processes of capital circulation and accumulation.

Urban Political Ecology: re-asserting the capitalist production of urban natures

The third perspective that I wish to briefly introduce is urban political ecology (UPE). While the previous perspective focused primarily on patterns of socio-ecological injustice within the city, urban political ecology shifts attention to the socio-ecological inequalities embodied in and shaped by the production and reproduction of capitalist urbanization itself (Keil, 2003; 2005). Taking its cue from the previous urban political ecological research summarized earlier, the theoretical objective of UPE is to explore the process of human and non-human assembly through which the city becomes constructed as a hybrid concentration of both social and physical objects pivoting around the social inequalities that are expressed in urban socio-ecological metabolic processes and render the urbanization process a highly unequal socio-ecological configuration whose functions (i.e. 'sustainability') is predicated upon geographically and ecologically widening networks of socio-ecological transformation (Swyngedouw, 1996; 2006).

Under capitalism, nature does indeed become increasingly implicated in the circuits of capital accumulation through which it is both transformed and de-/re-territorialized. This is a socio-metabolic process whereby "physical matter such as water or cows is transformed into useable, ownable and tradable commodities" (Coe, 2007: 161). From this perspective, 'Nature' does not exist, but rather there is a diverse and changing collection of all sorts of natures that become historically and geographically produced in specific and decidedly urbanised manners. It is such an approach that led David Harvey,

for example, to argue that "there is nothing unnatural about New York City" (Harvey, 1996). Indeed, large scale or 'planetary' urbanization of all manner of natures is *THE* spatial form of capital accumulation with all sorts of intended and non-intended, but thoroughly unequal, outcomes.

Urban political-ecology is decidedly anti-Malthusian. In contrast to the doomed-laden spectre of Malthusian limits on the Earth's resource base and the menace of inevitably pending scarcity, urban political ecology considers scarcity to be socially produced through the twin imperative of 'accumulation for accumulation's sake' on the one hand and 'market' forces as naturalized and privileged instruments for the social allocation and distribution of (transformed) natures on the other. A political-economic configuration (usually called capitalism) whose 'sustainability' is predicated upon growth for growth's sake necessarily hits the physical and social limits of its own pre-conditions for existence, thereby ushering in highly uneven dynamics of continuous socio-ecological transformation. More importantly, such produced urban socio-physical environments embody and reflect the unequal power relations inscribed in socio-ecological metabolism. The city becomes the arena *par excellence* where control, ownership, access, transformation, and quality of physical matter and its utilization/distribution are choreographed. 'Scarcity' resides therefore not in nature but in the socially constructed and utterly contingent modalities of its involvement within urbanizing circuits of capital circulation and accumulation.

The production of urban environments, and the 'metabolic vehicles' that make sure it functions (such as infrastructures of all kinds, the technical conditions that permit the flow and metabolization of energy, food, information, bodies and things – as well as their socio-ecological characteristics) are of course mediated by governing arrangements that are often nominally democratic, but are nonetheless necessarily deeply committed to ensuring the uninterrupted expansion of the capital circulation process. It is precisely this articulation between state, class and environmental translation that renders urban socio-ecological processes, including the question of 'sustainability', highly conflictive and subject to intense political and social struggle. Consider, for example, how the urban rebellion that engulfed Turkey with unprecedented intensity in the summer of 2013 was emblematically sparked off by a conflict over a park and a few trees in Istanbul's Taksim Square. Or how all COP global climate negotiations are met by increasingly intense street protests in each city that the climate governance circus visits (Swyngedouw, 2013b).

The urbanization of nature is extensively multi-scaled and spatially networked. Multi-level governance arrangements, from Agenda 21 to the Kyoto Protocol, suggest how the global span of socio-ecological transformation processes are articulated with multi-scale governance ensembles, each of which express particular power relations and geometries and where struggles for the control of, access to, and transformation of nature and the distribution of ecological goods and bads are carefully, yet intensely, negotiated and fought over. From this political-ecological perspective, urban ecological conditions and the configurations of their governance are never just local, but are attached to

processes that operate in the various and diverse ecologies of the world. Smart ITC soft- and hardware and its production, for example, is directly related to the socio-ecological abyss of Coltan mining on the one hand and the feverish search for new e-waste dumping grounds on the other. Such urban political-ecological approaches highlight the political core of environmental change and transformations and insist on the fundamentally political nature of the modes of socio-technically organizing the metabolic transformation of nature.

Therefore, urban political ecology is concerned with the democratic process through which such a politically embedded ecological transformation takes place. Rather than invoking a normative notion of environmental justice, political ecology insists on focusing on the realities of the presumed democratic political equality in the decision-making processes that organize socio-ecological transformation and choreograph the management of the commons. In doing so, attention shifts from a techno-managerial or ethical perspective to a resolutely political vantage point (articulated around the notion of equality) that considers the ecological conundrum to be inexorably associated with democratic political action (Swyngedouw 2014).

Deadlock!: the strange non-performativity of the urban environmental concern

Despite this extraordinary leap forward in critical understanding of the urban environmental condition and a consensual public concern with the same, exemplified by the ubiquitous attention that city councils and governors pay to urban 'sustainability' in virtually every city in the world, precious little is achieved to prevent greenhouse gases from accumulating in the atmosphere, the expanding use of natural resources, biodiversity loss, or the rapidly increasing privatization and commodification of the commons of the environment. Despite the omnipresent attention to 'sustainable' and 'smart' eco-technologies, and the concern for sustainable urban policies and lifestyles, the global ecological conditions continue to deteriorate at an alarming rate as planetary urbanization intensifies. This is a veritably paradoxical situation that can only be understood in strictly ideological terms. As Slavoj Žižek put it: "Despite the fact we know very well (the ecological predicated that we are in), we continue to act as if we do not know" (Žižek, 2008b). While the techno-managerial elites desperately attempt to micro-engineer the socio-ecological conditions in ways that make it possible to both sustain economic growth indefinitely into the future and turn environmental technologies into a 'green' accumulation strategy, the depth and extent of environmental degradation is rapidly heading for what Williams calls 'a combined and uneven apocalypse' (Williams, 2011).

It is also becoming abundantly clear that the ecologists' clarion call, to coin 20th century Italian communist Amadeo Bordiga, that 'when the ship goes down, the first class passengers drown too' is manifestly untrue. The first class urban passengers are busily building rescue vessels while ecological refugees drown in the Mediterranean and others continue to live in the

proliferating socio-ecological wastelands of their degrading environments. Planetary urbanization, unfolding through the universalization of the commodification and accumulation of natures within a neo-liberal political configuration, is accelerating the process of combined and uneven ecological apocalypse, one that is increasingly sustained by the mythical promise of technologically mediated sustainability and post-democratic forms of governance that do not tolerate radical dissent or the pursuit of political-ecological alternatives. The de-politicizing techno-managerial pursuit that characterizes dominant modes of environmental governance sutures the ideological landscape and forecloses more politically grounded modes of producing a more egalitarian socio-ecological mode of governance and transforming the commons (Swyngedouw, 2009a).

Transgressing this 'deadlock' between the real and present dangers of combined and uneven socio-ecological urban development on the one hand and the impotent action of post-democratic sustainable management on the other demand serious intellectual and political engagement with some of the most intractable conditions of our cities and world. And that is what we shall turn to in the conclusions.

From Combined and Uneven Apocalypse to New Beginnings: An Intellectual and Political Agenda

Urbanizing global environments

The present process of accelerating urbanization of globalization must be understood as a combined political-economic and socio-environmental project, one that is primarily configured and animated by increasing processes of, first, the commodification of natures and, second, its subsequent financialization that makes it possible to turn material natures into seemingly self-expanding circulations of fictitious financialized capital. Consider for example, the apparently unstoppable commodification of CO_2, H_2O, shale-gas deposits and other resources, land, waste, gene-codes, ecological services, and the like, the often speculative financial movements that implant themselves in and around the global circulation of these natures, and the multi-scalar governance arrangements, from local governments to countries and international organizations, that shape and intensify this neoliberal process of 'accumulation by dispossession' as David Harvey so aptly called it (Harvey, 2003).

An urgent research agenda is emerging that needs to focus on empirically detailing and theoretically exploring the geographically uneven conditions associated with the globally constituted networks, connectivities, and transformations through which this circulation of matter and money is organized, and to recognize the pivotal role of urbanization therein. Consider, for example, that the urban 'recycling' of electronic and other waste does not stop at the recycling plant, but now spans a truly global, often illicit, circuit of capital flows and socio-ecologically dangerous matter.

Such a research agenda needs to unravel the complex, shifting and power-laden social relationships that operate within cities, and examine how these are mediated by and structured through processes of socio-ecological change. In relation to this, future research must examine how the urban environment is constituted through socio-ecological metabolic flows (such as energy, CO_2, water, food, materials), sustained by a series of technological infrastructures and social, political and institutional support structures, and how these are implicated in the production of highly uneven socio-ecological configurations. Not only do we need to map, chart, analyze and understand the socio-ecological metabolism of cities, past and present, but we also need to critically imagine the metabolised socio-ecological relations that would operate under the potential and politically different alternatives that are beginning to emerge. As part of this agenda, research must pay attention to the networked relations that expand beyond the contemporary city to different scales and places, as well as to those extra-urban relations that are being proposed by new eco-urban political thought.

Post neo-liberalizing urban environments

The state plays a pivotal role in the process of organizing urban socio-ecological transformation. Whether deliberately or not, it helps determine who is exploited and ignored, or rewarded and listened to, and how these exclusions and privileges are exercised. It also has considerable power to exacerbate, displace or alleviate existing socio-environmental inequalities or create entirely new ones. Many EJ and UPE studies have highlighted the role of formal state institutions and actors as decision-makers in, for example, decisions to locate toxic facilities or about how non-renewable resources should be utilized. The role of the state in its various contemporary modalities, we argue, needs to be more central with increased links to the expansive and emerging work on neo-liberalization and crisis-mitigation policies. In particular, attention needs to be paid to the contradictory position between neoliberalizing growth and market-oriented politics on the one hand and the presumed attention to questions of socio-ecological cohesion and 'sustainability' on the other.

Viewing neo-liberalization as a contingent, path-dependent, amorphous and selective process of market-like state restructuring, we have begun to reveal its discursive constructs, actually existing and mutative forms, and its often socially and ecologically regressive consequences (see, for instance, Castree, 2008; Béal, 2008; Peck, 2010). The neo-liberalesque selective pluralization of policy circles to incorporate business elites (primarily), selective experts and community 'representatives' in new governance arrangements as well as the increasing reliance on industry 'self-regulation' in the form of non-binding voluntary standards have also been revealed and critiqued (Guthman, 2007; Swyngedouw, 2005; 2009a). Clearly then, neo-liberalization has implications for socio-environmental equality. It could be hypothesized that neo-liberalization and, in particular, the deeper post-crisis entrenchment of its practices, is

widening rather than resolving environmental injustices, making it more difficult for minority groups to have equal access to good quality environmental resources or for procedural equality in environmental decision-making to be achieved. Future research, therefore, needs to tackle this shortcoming to see how the nexus of neo-liberalization and environmental (in)equality is actualized in different urban contexts. The socio-ecological implications, displacements and rhetoric of neo-liberal technologies and strategies such as auditing, 'joined-up' policymaking, urban spectacles, the fetishistic emphasis on 'smart' eco-technologies, place marketing, financialization of everything, and gentrification should be critically analyzed with respect to their emancipatory and democratizing socio-ecological potential.

Urban socio-ecological movements and the political struggles or environmental equality

A key focus of the urban political-ecological literature has been on how people from disadvantaged communities in various localities have formed, or joined, movements to fight for environmental justice, inclusion or equality. As Agyeman points out, rather than taking a progressive stance that outlines a vision of socio-ecological utopia, these movements have overwhelmingly taken a reactionary, defensive stance, demonstrating against existing or proposed injustices (Agyeman and Evans, 2004). This literature has examined the formation and evolution of movements, their translation of grievances into 'repertories of action', their collective identity politics, and their influence on the targeted 'mechanisms' of injustice. It shows how socio-natural relations are produced, and by whom and for whom, as subjects of intense social struggle and contestation (Swyngedouw and Heynen, 2003). Some difficult questions and issues need to be raised in this context. For instance, have movements developed agendas and alternatives that if implemented would simply reproduce or relocate injustices and inequalities? Have they misunderstood or overlooked any environmental injustices? How inclusive are these movements? Are these movements' goals co-opted by more powerful bodies and, if so, how and why? Why have some movements dismantled or failed to achieve their goals?

More general work in urban political ecology and environmental political economy has begun to show the importance of scale, showing how social movements engage in scalar strategies such as 'jumping scales' and discursively framing their plight as an 'issue' on one scale or across multiple scales amidst the continued reworking of scalar power relations. As noted earlier, a growing number of studies have suggested an intense interconnectedness of place-based urban socio-ecological movements and a supposed internationalization of environmental politics [e.g. Carruthers (2008); Pellow (2007); Walker (2009b)]. These analyses offer valuable insights but more research is needed on how and why such movements alter, expand, or rescale their spatial focus; how and why their structures, tactics and discourses are replicated by groups in other places; and how and why they liaise and share resources with other groups.

We also need to understand more about how meanings and values are constructed and contested within these trans-local and trans-national networks. How, for instance, are one group's understandings of society-environment relations projected, evaluated and reworked when they engage with groups located elsewhere? To what extent have these meanings and values been universalized and, if so, how do communities in particular places 'ground' these universalized meanings and values and with what implications?

Urban socio-ecological imaginaries: the discourses of urban natures

The cultural, technical and political mediations through which the urban environment is (re-)configured cannot be understood without reference to discursive practices and how they intertwine with material processes and outcomes. Three important and inter-linked claims have been made in recent work on sustainability, discourse and the post-political condition. First, nature and its more recent derivatives, such as 'environment' or 'sustainability', are 'empty' and 'floating' signifiers (Swyngedouw, 2010). Second, there is no such thing as a singular 'Nature' around which an urban environmental policy or environmentally-sensitive planning and technical intervention can be constructed and performed. Rather, there are a multitude of natures and a multitude of existing, possible or practical socio-natural relations and socio-technical mediations. Nature becomes a tapestry, a *montage*, of meaning and equivalences, held together with quilting points (or *points de capiton*) through which certain meanings of Nature are knitted together, much like the upholstery of a Chesterfield sofa [see Žižek (2008a), Stavrakakis (1997), Swyngedouw (2010)]. Third, the obsession with a singular Nature that requires 'sustaining' or, at least, techno-administrative 'managing', is sustained by a particular 'quilting' of Nature that forecloses asking political questions about immediately and truly possible alternative urban socio-natural arrangements.

In part due to the growing global awareness of 'the environmental crisis', contemporary representations of 'Nature' have become more decidedly apocalyptic. The Real of Nature, in the form of a wide variety of real and customarily unsymbolised ecological threats (global warming, new diseases, biodiversity loss, resource depletion, pollution), has invaded and unsettled our received understandings of 'Nature'. This has forced yet another transformation of the chains of meaning that seek to provide 'content' for Nature, while at the same time exposing the impossibility of fully capturing the Real of Natures (Žižek, 2008b; Swyngedouw, 2013a).

These arguments are structured by the fundamental insight that the natures we see and work with are necessarily imagined, scripted, and symbolically charged as 'Nature'. These inscriptions are always inadequate, they leave something missing and maintain a certain distance from the natures that exist materially, and which are complex, chaotic, often unpredictable, radically contingent, historically and geographically variable, risky, patterned in endlessly complex ways, and ordered along 'strange' attractors [see, for

instance, Lewontin and Levins (2007)]. This means, quite simply, that there is no 'foundational' 'Nature' out there that needs or requires salvation in name of either Nature itself or a generic Humanity. There is nothing foundational in 'Nature' that needs, demands, or requires sustaining. The debate and controversies over Nature and what do with it, in contrast, signal rather our political inability to engage in direct political and social argument and strategies about re-arranging the socio-ecological co-ordinates of everyday life, the production of new socio-natural configurations, and the arrangements of socio-metabolic organisation (what is usually called capitalism) that we inhabit. The notions of urban sustainability and sustainable technology/development have symptomatically become the hegemonically and consensually agreed metaphors to signal the ecological quandary we are in (Swyngedouw, 2007). Indeed, one of the key pivotal 'empty' signifiers that have emerged to capture the growing concern for a 'Nature' that seemed to veer off-balance is, of course, 'sustainability'.

This scripting of Nature permits and sustains a post-political arrangement sutured by fear and driven by a concern to manage things so that we can hold on to what we have (Swyngedouw, 2007). This perspective leads Alain Badiou to insist that ecology has become the new opium for the masses, replacing religion as the axis around which our fear for social disintegration becomes articulated (but also from where redemption, if the warnings are heeded, can be retrieved). Such ecologies of fear ultimately conceal, yet nurture, a conservative or, at least, reactionary discourse/message. While clouded in rhetoric about the need for radical change in order to stave off immanent catastrophe, a range of technical, social, managerial, physical and other measures have to be taken to make sure that things remain the same, that nothing really changes, and that everyday life (or at least our lives) can go on as before. Is this not the underlying message of, for example, *An Inconvenient Truth* or of the report by the United Nation's Intergovernmental Panel on Climate Change (IPCC) on the human consequences of global climate change? Both these narratives, in their very different ways (popular/populist on the one hand, 'scientific' on the other), urge radical changes in the techno-organisational management of the socio-natural environment in order to ensure that the world as we know it stays fundamentally the same (Žižek, 2008b).

There is an urgent need ahead to delve into the complex links between discourse, post-political management and environmental socio-ecological inequalities. It should be asked what visions of 'Nature' and what socio-environmental relations are being promoted; what quilting points are being used and how they are being stitched together; and who is promoting these visions and why? Future research must also ask what issues and whose voices are being silenced in the process and how these discourses are competing with, altering and being altered by other alternative discourses. In this respect, we also need to consider more radical discourses, such as those of the environmental political movements or the various '*indignados*' that in recent years have been demanding a new constituent democratic process.

Ultimately, the intellectual challenge posed by the socio-environmental conditions and shaped by planetary urbanization must be to extend the intellectual imaginary and the powers of thought and practice to overcome the contemporary cultural injunction identified by Jameson that "it is easier to imagine the end of the world than changes in the eco-capitalist order and its inequities" (Jameson, 2003: 76). This courage of the intellect is required now more than ever, a courage that takes us beyond the impotent confines of a sustainability discourse that leaves the existing combined and uneven, but decidedly urbanised, socio-ecological dynamics fundamentally intact, and charts new politicized avenues for producing a new common urbanity.

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