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EMBEDDED ECONOMIES: COMPLEX URBAN ECOSYSTEMS AND SUSTAINABILITY PRACTICES

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Abstract

Purpose

This paper presents some processes that shape urban settings in complex ways: practicing places, alliances, circuits, assemblages, and hybridization. We contend that such processes are at the foundation of embedded economies in complex urban ecosystems.

Design/methodology/approach

We use a qualitative methodology based on archival research, survey of key research ideas, conceptual analysis and rapid ethnography to describe exemplary conceptual and analytical strategies. We also describe three relevant case studies: Grounding Urban Natures, Urban Planet and Ecological Urbanism.

Findings

A new vision fostering sustainable principles requires a rethinking of human values, and a reconsideration of the integration among the flow of perception, experience and consciousness. It is impossible to imagine a single solution to the problem of sustainability, but many complex, interrelated and evolving solutions. Holistic and unified knowledge can deal with complex global problems of sustainable development.

Research/Practical Implications

One of our main working assumptions is the idea that the economy is a material assemblage of complex urban ecosystems organized around processes of knowledge exchange in networks of high density.

Originality/Value

We suggest that a transdisciplinary approach to urban research is necessary in order to account for the inherent complexity of cities and the analytical challenges of such urban complexity: interactions, adaptation and governance. We also suggest some approaches to urban sustainability that are consistent with material economies and the complexity of territorial ecosystems.

Keywords: urban complexity, transdisciplinarity, circuits, alliances, planning cultures, assemblages, sustainability practices

JEL Codes: A12, A14, P48, R58

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1. Introduction: Complex Transactions

Urban complexity can be said to emerge from the decentralized and self-organizing webs, assemblages and networks of transactions and interactions among a wide range of heterogeneous actors, agents and stakeholders that typically occur at multiple scales in dynamic, fuzzy, changing and uncertain urban settings. These transactions and interactions of cooperation and competition, informed by serendipity and randomness, highlight agents' perceptions, choices, decisions and preferences (Batty, 2008; Healey, 2007; Taylor, 2005, Castells, 1996).

Agents, actors, actants and stakeholders can be individual, community, city and regional, involving social, economic and political institutions. Their mutual interactions produce feedback loops that allow the adaptation of individual and group actors and the emergence of phenomena, patterns and outcomes (physical, behavioral, social, economic, ecological, environmental) that cannot be predicted by analyzing the particular webs, assemblages, networks and their constituents and components (Miller, 2016; Bunge, 2014; Alexander, 1965; Barabasi, 2003).

The walker in the city continually invents spaces by means of practicing the places in the built urban environment. According to Michel de Certeau (1984), walking defines spaces of enunciation. Similarly, geometry opposes itself to experienced anthropology, and so do maps (reifications, abstractions of the rich diversity of itineraries that can be practiced by individuals) in relation to tours. Power strategically establishes a place, an order, a particular distribution of stratified elements available for analysis, whereas resistance tactically articulates variations within such an order, and so practices spaces.

Practices of resistance become, then, "spatial stories," and through them there occurs "a constant transformation of places into spaces and of spaces into places." Spaces, thus, are thought of as open to human creativity and action. De Certeau believes that spaces can be more easily liberated than Foucault imagines, because individual practices "spatialize" rather than localize in repressive grids of social control. Space, therefore, is not simply a metaphor for a site or container of power (de Certeau, 1984: 59-67).

Resisting means then marking out boundaries, for the symbolic creation and recreation of spaces is an act of partitioning and differentiating. In this sense, it also constitutes and act of foundation, "of creation of a field that authorizes dangerous and contingent social action" in a "fragmented," miniaturized," and "polyvalent" form. Resisting (spatial stories, practices, operations) also means transcending frontiers and crossing bridges. By privileging a "logic of ambiguity," the spatial stories of resistance represent "a departure, an attack on a state, the ambition of a conquering power, or the flight of an exile; in any case, the `betrayal' of an order," the "tour over the state," narrativity "in its most delinquent form" (de Certeau, 1984: 115-119).

De Certeau conceives narrative in a quite broadway as creations of spaces (as opposed to established places), as description (as opposed to theorization), as an art (as opposed to discourse), and as a private knowledge that remains "on the margins...of scientific or cultural orthopraxis." It is "the status of a know-how without discourse." Not only all manifestations of popular culture (ordinary language, tales, games, legends), but also any kind of "spatial practice" (walking, incarceration, railway navigation), and also reading and believing constitute objects for narrativity. Narrating represents an avoidance of totalizations and a foundation of spaces (which, as we have seen, challenge the unifying thrust of places). Indeed, "deprived of narrations...the

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group or the individual regresses toward the disquieting, fatalistic experience of a formless, indistinct, and nocturnal totality" (de Certeau, 1984: 123-30).

2. Collective Intelligence and Complexity

The Massachusetts Institute of Technology´s Center for Collective Intelligence is fully devoted to advancing knowledge on this matter. Collective intelligence has been the goal of visionaries throughout the history of the Internet. As Gruber reports:

> "Douglas Engelbart, who invented groupware, the mouse, and a form of hypertext designed for collective knowledge, wrote in 1963 of his career and project objective: `The grand challenge is to boost the collective IQ of organizations and of society.´His Bootstrap Principle was about a *human-machine system* for simultaneously harvesting the collected knowledge for learning and evolving our technology for collective learning. In human-machine systems, both the human and machine contribute actively to the resulting intelligence, each doing what they do best. Other early pioneers of the human-machine model of collective intelligence include Norbert Wiener, the father of cybernetics, Buckminster Fuller, the consummate inventor and system thinker, and Stewart Brand, creator of the first large virtual community on the Internet. Tim Berners-Lee, the inventor of the World Wide Web, describes his vision of the Semantic Web in these terms: `The Semantic Web is not a separate Web but an extension of the current one, in which information is given well-defined meaning, better *enabling computers and people to work in cooperation´*[emphasis added]" (Gruber 2008).

Most discussions on collective intelligence or "wisdom of crowds" refer to the Social Web. Here the idea is that the individual contributions by web participants create value for anyone just by being available for reading and usage. To what extent new knowledge emerges by the juxtaposition of high number of data and information sources is clearly a complexity issue. As Gruber argues, emergent knowledge (inherent to complex situations) takes place when "the system enables computation and inference over the collected information, leading to answers, discoveries, or other results that are not found in the human contributions" (Gruber 2008).

In fact, "emergent knowledge" (that is, complexity) is one of the potential outcomes of intercultural research. Knowledge emergence in intercultural research would materialize if research participants are able to "bootstrap" their collective intelligence. Intercultural research can be conceived as a complex information repository. It can also be conceived as an active framework where participants actively interact to express their knowledge interests and needs, to request specific knowledge and to apply intercultural knowledge to problem-solving and in general to address their collective needs. Some of the examples in this paper show these possibilities and also some current limitations.

3. Complex Alliances and Global Policy Circuits

In recent years, citizen participation in urban planning processes has become both a demand and a reality (Anciano & Piper, 2018). Collaborations among city planners, architects, social

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scientists, urban activists and citizens to analyze and try to solve city problems constitute a form of intercultural research given the different worldviews and epistemic cultures (Knorr Cetina, 1999) of each group involved.

This mode of intercultural action research involves issues of decentralization and devolution of powers, building trust, achieving fair representation, enabling resources and support systems, or building transparency through platforms of engagement.

Enabling true and effective citizen participation in an existing administrative set up is a complex process with challenges such as finding an amicable power and responsibility distribution framework, a building of additional capacity amongst both, government officials and citizens alike, "ensuring fair civil society representation and enabling resources to support it. In many countries, decentralization of power requires institutional, legislative and political support at different levels of governance" (USAID, 2008: 121).

In parallel is the perceived threat of erosion of powers leading to cases where the effectiveness of decision-making and impact of local committees "are significantly hampered by red tape, bureaucracy, and required approval from government agencies. In addition, approaches may lead to prioritization of only those projects that will contribute to increasing revenue of the area, over socially benefitting projects" (Rajesh, 2009: 62).

City governments sometimes look at citizen engagement both through institutionalised structures and others such as citizen-led groups to act as active partners in the co-creation of the policy and planning process. Enabling multiple platforms of engagement enabling active participation helps build transparency by making information readily available. "While e-governance platforms have proven to be very effective in cities across the world there have been many other technological platforms that have been developed and are being used in the areas of collecting empirical data and allowing participation from different stakeholders" (CURS, 2008: 83).

Collaborations among different epistemic cultures in participatory urbanism, a form of intercultural research, require city governments to make available different channels of engagement and participation. These engagements will also essentially need to tie together into a comprehensive local area development plan and ensure optimal utilization of all available resources.

Researchers on transnational urban policy seek to analyze the factors enabling and constraining the formation of transnational circuits of policy adoption and adaptation as well as the social organization and consequences of the complex interconnectivity of cross-border networks in urban policy. Urban policy and ideas, framed or not as "best practices," travel around the world (Healey, 2013). This process lies at the foundation of a mode of intercultural research whereby transnational policy circuits foster spatially unbounded collaborations and implicit partnerships, from policy creators to receptors and adopters.

Urban policy travels can thus be said to underline "the socio-spatial processes by which social actors and their networks forge the *translocal* connections and create the translocalities that increasingly sustain new modes of being-in-the-world" (Smith, 2005). This complex interconnectivity working at a distance is multidimensional, encompassing social, economic, and political relations as well as cultural and interpersonal networks and technological

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linkages. It is also a complex process subject to misplaced expectations and failure. Two main examples of urban policy travels are the Bilbao Effect and Dubaization, discussed elsewhere (del Cerro Santamaría, 2020).

4. Embedded Economies in Urban Planning Cultures

Planning culture refers to conceptions, institutions, ethos, attitudes and practices, and has a direct effect on the prospects for intercultural research (Friedmann, 2005). Urban planning practices and cultures are perceived to have converged due to the rapid expansion of information and communication technologies since the mid-1990s. However, empirical research on planning cultures shows that the strategies developers by planners to adapt to change vary widely, and the variation depends on multiple factors. For example, there is a significant degree of variation in the adoption of neoliberal policies and rhetoric and the translation of these to planning practice among nations (Sanyal 2005).

Transnational interconnectivity has changed local planning cultures, but we cannot speak of a significant move towards homogenization or convergence of urban planning practices at a global scale. In fact, the collective ethos and dominant attitude of professional planners in different nations varies toward the appropriate roles of the state, market forces, and civil society in urban, regional, and national development. "The reality of changing urban planning cultures over time leads to characterize urban planning cultures as not indigenous and immutable, but rather evolving with social, political, and economic changes both within and outside the national territory" (Sanyal 2005).

The claim by neoclassical economists that cultural differences among peoples of the world are not relevant cannot be defended. If economists were right, intercultural research in urban planning would simply focus on creating institutions that would facilitate, not hinder, the universal urge among people to maximize their self-interests. Such is not the case. As a result, we face a complex phenomenon. As Sanyal states:

> "International flow of planning ideas also affects planning styles, although not to the extent claimed by either its critics or its proponents. How does one develop new insights about such a complex social process with multiple and interconnected causes and effects?" (Sanyal 2005, 17).

As cultural anthropologist Richard Shweder recently noted,

> "Cultural elements are too hard to define, too easily copied and too long detached from their points of original creation. Contact between cultures and processes such as borrowing, appropriation, migration, and diffusion have been ubiquitous for so long that little remains of the authentically indigenous" (Shweder 2003).

All of this has direct consequences for the realization of intercultural research in urban planning because the existence of a diversity of cultures resembling "a complex traffic of ideas" challenges and complicates both alliance formation and the processes of adoption and adaptation of urban policies and practices, as we have seen in our examples (Sanyal 2005; Pasquier & Nicolescu 2019).

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Even if the city as an intercultural milieu is conducive to the necessary cosmopolitan attitude that fosters intercultural linkages, as we saw in the previous paper, the challenges are formidable. The structuring of cities around borders and citadels, virtual and symbolic or cultural walls and ghettos, as well as the challenges to translation, adoption and adaptation of urban policies across distinct local planning cultures, are obstacles for the transferring of urban knowledge around the world and thus for the possibilities of effective intercultural research.

Participatory urbanism shows the way forward as an intercultural practice for researching and analyzing urban problems. However, issues of decentralization and devolution of powers, building trust, achieving fair representation, enabling resources and support systems, or building transparency through platforms of engagement represent potential limitations to this approach. The fading away of the Bilbao Effect and the limited impact of Dubaization are illustrations of several drawbacks in the materialization of circuits and so-called best practice adoption.

In addition, the sheer complexity of alliance formation and circuit efficacy, as well as the predominance of different epistemic cultures (with distinct conceptual sets) among participants in intercultural research, analysis and practice present substantial challenges to effective intercultural communication. The existence of different values and cultural contexts complicates efforts at interpretation and fair judgment among parties involved in practices of complexity and intercultural research.

As Sanyal remarks:

> "There is no cultural nucleus or core planning culture, no social gene that can be decoded to reveal the cultural DNA of planning practice. Planning culture, like the larger social culture in which it is embedded, is in constant flux" (Sanyal 2005, 14).

Thus, the focus of inquiry for intercultural research in urban planning should be the continuous process of social, political, and technological change, which affects the way planners in different settings conceptualize problems and structure institutional responses to them.

> "If planning culture is viewed in this dynamic way, in contrast to traditional notions of culture that are used to evoke a sense of immutability and inheritance, then we can go beyond "cultural essentialism," which, in essence, is exclusionary, parochial, and an inaccurate representation of history" (Sanyal 2005, 19).

The idea of *embedded economies* implies developing a *mentally mobile attitude* informed by flexibility and creativity that is able to translate symbolic codes across fields of endeavor and practices. In urbanism, such disposition to translate can be expressed as "practicing places." For complexity and intercultural research, the notions that best capture such mobile disposition are "assemblages" and "hybridization." Research strategies, such as transdisciplinarity and socio-materiality, also have the potential to cross over binary oppositions and overcome the challenges of alliances and circuits in urbanism.

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4.1 Socio-Materiality

Socio-materiality reveals the inherent complex nature of empirical reality and the need to account for such complexity in our analyses. Actor-network theory and assemblage materialist approaches propose to overcome what Alfred North Whitehead named "the bifurcation of nature" expressed in the secular dichotomy nature-culture (Whitehead 1920). A step in this direction can be helpful in efforts at developing meaningful intercultural research on the ecological crisis and sustainability in the Anthropocene (Morton 2019).

Within urbanism, materiality and assemblage thinking have found friendly ground (Farías & Bender 2010). After all, the built environment is an inescapable material reality to be grasped from the outside, through "the observation of concrete materials, not the workings of the mind in isolation" (Sennett 1992, 196). Jane Jacobs already observed that buildings, streets and neighborhoods work as dynamic organisms, changing in response to how people interact with them (Jacobs 2000).

Materiality aims at knowing not by defining the objects but instead by becoming sensitive to the immanence of vibrant matter itself, its influences, results and consequences. In this vein, French sinologist François Jullien has stated that "a wise man does not have ideas" that are independent of matter (Jullien 2001).

We need not produce a conventional, rationalist theory to explain intercultural research in urbanism. As Beauregard and Lieto have shown (Beauregard 2015; Beauregard & Lieto 2016), we need to aim at something different and perhaps more necessary and effective: to give meaning to new materiality by fostering a new sensitivity, orientation and disposition towards the central role of non-human elements in intercultural research within urbanism and urban planning. Urbanists as intercultural researchers would need to be both craftsmen of good ideas (by gathering knowledge, people and material things) and public intellectuals (by forming alliances around matters of concern).

A new focus on materiality in intercultural research would focus on the role of non-human entities (plans, documents, arguments, expertise, buildings, etc.) in how planners envisage the connections among norms, technologies and life-worlds through networks of human associations, technologies, natural ecologies and places, sites and settings (Beauregard 2015).

In spite of a new focus on matter, intercultural research needs to be sympathetic to inclusive epistemologies that affirm ontological realism while giving room for the shaping role of the knowing subject via perception, imagination, memory and affects. This is important because the pretensions of pure objectivism in some interpretations of ANT, rejecting or downplaying the crucial role of the mind in shaping human understanding and inquiry, are hard to defend. It is crucial to not misrepresent the causal capacities of non-human objects while effacing the significance of the capacities of human beings. Human attributes such as intuition, affect and emotion are the pulse of socio-materiality (Müller 2015).

A relational approach in intercultural research is not qualitatively different from conventional sociological or technical applications of network analysis, which are mainly devoted to mapping connections among network members. However, it is possible to suggest that "network" would work in intercultural research as a metaphor conveying the complexity of trying to capture the multiple and changing relational dimensions of always-mobile assemblages.

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Socio-materiality is not widely embraced among planning theorists. The reason might have something to do with humanism and post-humanism. It certainly has something to do with the misconception that ANT proposes to make non-humans into humans, thus ignoring the very precise definition of an actor that ANT deploys -- which is, itself, a theoretical extension of the notion of "affordances" (Gibson 1979; Lieto & Beauregard 2016). The idea of "affordances" refers to the properties of matter, these properties being what influences how humans interact with things. Affordances, as applied to both things and places, are properties that allow a person to do some things and not others, but are not fully constraining.

4.2 Assemblages and Transdisciplinary Urbanism

Homi Bhabha's notion hybridity/third space (Bhaba, 1994) is akin to the notion of "assemblage" (Deleuze & Guattari, 1987). Both notions connect spatial concerns with cultural politics to provide multiple identities challenging all the binaries which are part of homogenisation and universalisation of human existence with singular analytical categories. Research in urbanism has the potential to overcome the barriers to alliances and circuits through an ontology and epistemology developing around the idea of assemblages or "rhizomatic research cultures" (Guerin, 2013).

The iconography of assemblages is akin to transdisciplinarity. Since Berger and Luckmann (1966) we know that reality is socially constructed. People and groups interacting in a social system create, over time, concepts or mental representations of each other's actions, and that these concepts eventually become habituated into reciprocal roles played by the actors in relation to each other. When these roles are made available to other members of society to enter into and play out, the reciprocal interactions are said to be institutionalized. In the process, meaning is embedded in society. Knowledge and people's conceptions (and beliefs) of what reality is become embedded in the institutional fabric of society. Reality is therefore said to be socially constructed.

However, the social sciences by themselves cannot adequately come to terms with the ontology of reality, in particular urban reality. Leading urban researchers such as Manuel Castells, Janet Abu-Lughod and Saskia Sassen have recognized that the reality of the city cannot be understood from a single disciplinary perspective. Also, in two joint sessions of the British and American Sociological Associations held during the course of 2001, the conclusions pointed towards a necessity for interdisciplinarity and multidisciplinarity to enrich the perspectives within urban sociology (Perry, 2002). Even if it seems appropriate to prescribe interdisciplinarity and multidisciplinarity for urban studies, this strategy would not solve the conceptual and epistemological problems of a field that faces the massive ontological transformations brought about by conditions of planetary urbanization. We are in need of a new perspective that goes beyond disciplines: a transdisciplinary perspective.

Because urbanism engages, both as a discipline and as a profession, with broader societal concerns (e.g. situated knowledge, participatory design, everyday practices), it therefore seems obvious that hybrid modes of inquiry ought to be part of the knowledge landscape. Whereas *inter*disciplinary knowledge is located in scholarly environments, *trans*disciplinary knowledge production entails a fusion of academic and non-academic knowledge, theory and practice, discipline and profession.

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Several attempts have been made towards less reductive approaches to space and design; approaches that no longer *choose* between theory and practice as the ideal locus for critique, but, instead, allow critique to be processed in ways that are more complex and more entangled; approaches that advocate hybrid modes of inquiry and research.

One can think of the hybridization of nature and technology, engineering and the social, facts and values, human and non-human, and the explicit attention to agency in science and technology studies (STS) and ANT, actor-network-theory (Latour, 1987). Such approaches have in common their suggestion to approach urban issues not according to predefined ideologies or (critical) theories but to study them as a problem of the outside – as situated, complex gatherings of all sorts of agencies, where the notion of transdisciplinarity can be applied meaningfully.

4.3 Complexity and Transdisciplinarity

The idea of complexity is embedded in transdisciplinary strategies. The notion, for example, of "strategic urban planning" (Hersperger et al, 2018) has become paramount in efforts to address sustainability challenges in urban environments. This notion involves a holistic approach to problem-solving in the area of sustainability that implies placing the idea of complexity at the forefront of analysis and action. Complex thought, education and knowledge, in Edgar Morin´s understanding, take into account contextual, global and multidimensional factors to devise strategy conducive to more fruitful action.

> "Pertinent, knowledge must confront complexity. Complexus means that which is woven together. In fact there is complexity whenever the various elements (economic, political, sociological, psychological, emotional, mythological …) that compose a whole are inseparable, and there is inter-retroactive, interactive, interdependent tissue between the subject of knowledge and its context, the parts and the whole, the whole and the parts, the parts amongst themselves. Complexity is therefore the bond between unity and multiplicity. Developments proper to our planetary era confront us more frequently, ineluctably with the challenge of complexity" (Morin, 1999: 19).

Complex knowledge also factors in the centrality of the knowing subject in analytical endeavors, the uncertainty of the knowledge enterprise itself and the incompleteness and undecidable nature of *homo complexus´*s human action. Through complex knowledge, the holistic quality of urban planning naturally leads to a transdisciplinary conception of theory-building and practice development.

A transdisciplinary way of thinking would cross traditional disciplines and would modify the classical notion of science. A new vision fostering sustainable principles requires a rethinking of human values, and a reconsideration of the integration among the flow of perception, experience and consciousness. It is impossible to imagine a single solution to the problem of sustainability, but many complex, interrelated and evolving solutions.

To avoid current destructive human behavior, we need to develop a new collective perception of human relations towards the valorization of a new set of attitudes and behaviors or towards a different prioritization of the set of current values. Holistic, unified, transdisciplinary knowledge, can deal with complex global problems of sustainable development.

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5. Sustainable Practices in Complex Urban Ecosystems

Environmentalism is just one of the components of any comprehensive strategy for sustainability, and it is perhaps the one that is receiving most attention (Nordhaus, 2013; Stern, 2015), also from the perspective of urbanism. Any conception of sustainability would be rooted in our understanding of urban natures and ecologies, and the theoretical, methodological and epistemological approaches we use to discern the meaning and implications of these ideas.

"Natural" means preserving or sustaining the planet and our well being, and this is particularly necessary in cities. "Ecological" involves the relation of living organisms to one another and to their physical surroundings; it is an essential concept increasingly tied to the urban and studied as such. The three books to be reviewed in this essay offer new knowledge about sustainability by interrogating the particularities of urban ecologies and natures from different, distinct angles.

Issues and concepts characterizing the mature stage in the globalized urbanization paradigm (del Cerro Santamaría and Davis, 2011), such as scales and networks (in the realm of complexity), as well as the role of states, governance and path-dependence, are present, in varying degrees, in each of the three books. This would help readers situate these research works on nature, ecologies and sustainability within the ongoing stream of urban scholarship.

5.1 Grounding Urban Natures

Emphasis on "context" is akin to relational analyses stressing "glocalization" (Robertson, 1995), fragmentation and juxtaposition. This points toward a middle-ground theorizing, between the explanatory excesses of universal arguments and the intrinsic limitations of local perspectives. In a certain way, this is the old "nomothetic vs. ideographic" debate, which is present in the old idea of "the city in cultural context" (Agnew et al, 1984), and in the highly valuable contributions to urbanism by Anthony King (2015).

The book's editors, H. Ernstson and S. Sörlin, provide a masterful introduction where they (1) detail the Western theoretical developments on the idea of urban natures and ecologies (pp. 1-17), and (2) stress the need to utilize insights and perspectives from "Southern Urbanism" for a reconceptualization of urban natures (pp. 17-24).

The comparative method they advocate consists of "grounding" and "worlding" urban natures. This means using (1) in-depth case studies, (2) "productive geographies" and (3) "conceptual vectors" so that differences are attended to but not essentialized. This three-fold strategy is deliberately designed to support a more global urban analytical project, in contrast to other comparative approaches, such as Janet Abu-Lughod's highly effective "close comparisons" strategy (Abu-Lughod, 1999).

To this effect, the comparative strategy in *Grounding Urban Natures* proceeds by selecting "comparators" relevant to a diversity of urban contexts, instead of comparing relatively similar cities, as in the close comparisons procedure. Cities are not "cases" because what is being compared are processes across cities and countries, not the cities themselves. Substantively, the book explores "Unexpected Natures" (Part Two, after the Introduction), "Popular Natures" (Part Three), and "Technological Natures" (Part Four).

The chapters in "Unexpected Natures" show how "urban nature is broader than the fixed things of green space; it is a cultural and biophysical process, including built natures, gardens, parks, weeds, animals, etc." (p. 25). The chapters in "Popular Natures" demonstrate "how popular

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movements have reworked and resignified the values and meaning of urban natures […] and thereby affected who can claim to know urban nature" (p.26).

"Technological Natures" explores how abstract models of urban-nature used in urban planning actually work, and how techno managerial solutions flow between cities and countries to influence urban planning" (p. 27). The *Conclusion* to the book, by editors H. Ernstson and S. Sörlin, focuses on the common thrust of developing an approach that "sustains the multiplicity of urban nature [and] affords and provides space for various ways of knowing and ways of being within and in relation to urban nature […]" (p. 365).

Ernstson and Sörlin suggest the following paths forward: (1) to engage critically with urban ecology as conceptualized in the environmental sciences; (2) to develop comparative "productive geographies" exploring both the local and translocal character of urban natures; (3) to shift away from anthropocentric approaches to urban natures and account for wider forms of bio-agency; (4) to draw on postcolonial and decolonial scholarship in order to forcefully prevent Western biases (pp. 378-38).

5.2 Urban Planet

In this reader's understanding, urban complexity can be said to emerge from the decentralized and self-organizing webs, assemblages and networks of transactions and interactions among a wide range of heterogeneous actors, agents and stakeholders. Such webs of interactions typically occur at multiple scales in dynamic, fuzzy, changing and uncertain urban settings. Further, these transactions and interactions of cooperation and competition, informed by serendipity and randomness, highlight the perceptions, choices, decisions and preferences of agents.

Complexity approaches in the social sciences are not new. We find them in world-system analyses (directly inspired by chemist Ilya Prigogine; see Wallerstein, 2013); in the network society approach by Manuel Castells (2009); in actor-network and assemblage theories (Latour, 1993; Deleuze & Guattari, 1987); in cybernetics and systems theory (von Bertalanffy, 1981; Wiener, 1964; Luhmann, 2012); and in the new materialities approach to urban planning (see Lieto and Beauregard, 2016).

This work is a valuable start in the process of *integration* that is needed in urban knowledge production in a multiplicity of disciplines at different research settings and realms of practice. Perhaps a step further in integration would have been to set a dialogue between the academic and non-academic contributors to the book and publish those dialogues. The book suggests that any future urban knowledge production would need to focus on systems, co-production and solutions-oriented analysis.

It is helpful to remember that nature, just like economies, is a distant cry from self-regulated systems. Darwin does not celebrate the harmony of nature, but how small differences can suddenly become significant differences as a result of geographical drift and climate change. Something very similar happens in cities as environments of organized complexity.

The lesson here would be to issue a call for analytical transactions between complexity and political economy. We are used to complexity approaches leaning towards highly quantitative procedures, but this need not be the only direction forward, as the work of Edgar Morin on complex thinking (2008) shows. ¨Sensitizing concepts¨ in complexity science (e.g. adaptability,

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evolutionism, emergence, randomness, and others) can enrich and expand the analysis of power and uneven development.

5.3 Ecological Urbanism

While *Urban Planet* superficially explores transdisciplinarity as a sub-product of urban complexity, *Ecological Urbanism* is a decidedly vigorous statement for transdisciplinarity in architecture and urban planning from the outset, even if a fully-fledged transdisciplinary methodology is never developed in the book. This *oeuvre* works as a "meeting point" where the very brief contributions of the many authors show how architecture is integrating other disciplines, including the social sciences, into design thinking (see Davis, 2015).

The contributions of architecture to urbanism and urban studies are well known. Social scientists have benefitted from the understanding of space in the urban realm by architects. Architects, in turn, have for a long time tried to understand the architectural project within capitalism (see Tafuri, 1979; del Cerro Santamaría, 2007). The late architect Michael Sorkin, who passed away in New York in March 2020 due to covid-19, was a major force in blending architectural and social-scientific concerns in his books (see, inter alia, Sorkin, 2018). From a more substantive perspective, a sociology of architecture (both macro and micro) has been developing for some time with some success (see Stevens, 2002; Sklair, 2017).

Ecological Urbanism is more ambitious in the gathering of disciplinary interests, from humanities, literature and cultural theory to engineering, biology and computation. A total of 43 contributions (in 117 chapters) are about urbanism and ecologies by authors alien to the field of design. The juxtaposition of contributions is valuable because of the quality of the authors contributing and the huge variety of approaches. Unlike other works trying to infuse design with complexity science in a systematic way (Mehaffy and Salingaros, 2015), *Ecological Urbanism* focuses on conceptual ties and transactions across disciplines and much less so about specific strategies that would do the job of linking science, design, humanities and other relevant disciplines.

Mostafavi's *Introduction* stresses transdisciplinarity as an effective way to move the architectural and planning project forward. He describes sustainability as an essentially transdisciplinary problem and describes the matter of "scale" as a key for architects to reconsider and expand the boundaries and scope of the urban. Mostafavi, a former Dean at Harvard GSD, relies on Félix Guattari's *The Three Ecologies* (environment, social relations and human subjectivity), his concept of "ecosophy" and Lefebvre's idea of "transduction" (p. 26) in order to begin shaping his transdisciplinary proposal for the design field. Environmental planning and landscape ecology, with an emphasis on biodiversity, would be at the core of such a proposal.

The book includes twelve parts that could be reclassified into four main themes: concepts, practices, cases and technologies. Even if the introduction hardly mentions how complexity can help the transdisciplinary project in design, many of the contributions do address this issue in summary form. Several chapters address the issue of compact cities (chapters by Glaeser, Fainstein, Crawford, Forman) and how urban environments can promote ecology and sustainability more effectively than non-urban environments.

The book benefits from the participation of highly respected authors in many fields. Within architecture and design, the book includes contributions by Rem Koolhaas, Rafael Viñoly,

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Herzog & De Meuron, Toshiko Mori, ARUP or Iñaki Ábalos. Cultural theorist Homi Bhabha writes about sustainability in Mumbai. The late sociologist Ulrich Beck writes about inequality and climate change. Bruno Latour summarizes his well-known thesis that we need to "go back to Earth." Susan Fainstein invites to reflect on ecological justice. Edward Glaeser points out that much of the difference in carbon usage across space comes from basic forces such as space and density. Jeremy Rifkin describes how some architects have adopted his "Third Industrial Revolution" approach.

The *Ecological Urbanism* project deserves attention because it can lead to a more detailed understanding of the ties between sustainability and transdisciplinarity. The practice of transdisciplinary research faces formidable challenges. The integrative and holistic transdisciplinary attitude, which fosters the understanding of complexity, may never produce a shared instrumental canon. Transdisciplinarity, however, fulfills an important role by raising awareness of the need to co-create knowledge in the interstices between disciplines. *Ecological Urbanism* is a valuable contribution in this direction.

Scholars such as Leslie Sklair and Bruno Latour have pointed out that, in spite of all the risks associated to the environment, the human species seems to continue "sleepwalking" on the Anthropocene. The problem is not only ontological, that is, a deficiency in perceiving and grasping risks and their consequences. The problem is also epistemological, triggered by faulty or increasingly irrelevant analytical approaches to critical issues and fields of endeavor, such as urbanism.

The three books entice readers to relativize and question the "planetary urbanization" approach by suggesting new realms to be considered in any study of urban ecologies. For a truly comprehensive approach, sustainability research would need to factor in the importance of towns and land, as Forman does in his contribution to *Ecological Urbanism* and his other publications (Forman, 2019).

An issue for urbanists would be how to integrate in their analyses ex-urban perspectives while going beyond the rural-urban divide and placing ecology and sustainability at the center of research. Rather than "the city" or "urbanization," would the notion of "megaregion" provide a forward direction and a focal point for research and knowledge organization in the field?

6. Conclusions: Strategy, Holism and Transdisciplinarity

A major effort to stop the effects of climate change and support environmental sustainability has been developed around the world at the urban and regional levels around the concept and practice of the "sustainable city" and its associated planning practices. Planning schools around the world have included "sustainability" as one of their essential interests and today it is difficult to find professionals and academics who are not concerned with sustainable cities and the impact of climate change and global warming on the practices of urban planning. Urban systems have the potential to be more sustainable than suburban or rural communities. Therefore, it could be said that urbanization shows a potential to facilitate the management, and perhaps control, of climate change. The difficult challenges to achieve it come, not from the cities, but from the incentive structures of the capitalist system.

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The notion of "strategic urban planning" has become paramount in efforts to address sustainability challenges in urban environments. This notion involves a holistic approach to problem-solving in the area of sustainability that implies placing the idea of complexity at the forefront of analysis and action. Complex thought, education and knowledge, in Edgar Morin´s understanding, take into account contextual, global and multidimensional factors to desvise strategy conducive to more fruitful action.

> "Pertinent, knowledge must confront complexity. Complexus means that which is woven together. In fact there is complexity whenever the various elements (economic, political, sociological, psychological, emotional, mythological …) that compose a whole are inseparable, and there is inter-retroactive, interactive, interdependent tissue between the subject of knowledge and its context, the parts and the whole, the whole and the parts, the parts amongst themselves. Complexity is therefore the bond between unity and multiplicity. Developments proper to our planetary era confront us more frequently, ineluctably with the challenge of complexity" (Morin, 1999, 15).

Complex knowledge also factors in the centrality of the knowing subject in analytical endeavors, the uncertainty of the knowledge enterprise itself and the incompleteness and undecidable nature of *homo complexus´*s human action. Through complex knowledge, the holistic quality of urban planning neturally leads to a transdisciplinary conception of theory-building and practice development.

Thus, a possibly fruitful way to apply this notion of strategic urban planning would be to propose a transdisciplinary paradigm to address urban challenges. Strategy by itself is insufficient if it is based on traditional approaches to knowledge generation. A global and transdisciplinary strategy of sustainable development is required. The concepts in individual disciplines are not necessarily univocal. The global problems of sustainable development consist not only in some of the environmental problems (generally known as climate change and loss of biodiversity), but also in socio-economic issues, whatever exactly "sustainability" and its possible and multiple interpretations, involves politics, resources and power. Most current attempts to solve sustainable development are not conducive to sustainable development; they are mostly contradictory, inconsistent and inefficient. This contrasts with the nature of the behavior of sustainable development systems, which is non-linear and holistic.

"Green reformism" is based on a paradox, because it simultaneously adopts neoliberal capitalism and rejects economic growth. Although "green reformism" has developed an integral form of natural resource management, it has a poorly defined vision and well-being of human development. The current consideration of sustainable development in literature and the media is basically reductionist and involves mainly a binary thought. The problem is that reductionism, binary logic and disciplinary approaches are beliefs that must be overcome.

A transdisciplinary way of thinking is in order for a sound account of embedded economies in complex urban ecosystems. Such a way of thinking would cross traditional disciplines and would modify the classical notion of science. A new vision fostering sustainable principles requires a rethinking of human values, and a reconsideration of the integration among the flow of perception, experience and consciousness. It is impossible to imagine a single solution to the

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problem of sustainability, but many complex, interrelated and evolving solutions. To avoid current destructive human behavior, we need to develop a new collective perception of human relations towards the valorization of a new set of attitudes and behaviors or towards a different prioritization of the set of current values. Holistic and unified knowledge can deal with complex global problems of sustainable development. Progress has been made in this regard and continues to be made, within the United Nations and in other forums and institutions. If, in addition, a rethinking of the priorities and structures of economic incentives is achieved, then we can say that there may be a space for hope.

REFERENCES

Abu-Lughod, J. *New York, Chicago, Los Angeles. America's Global Cities*, Minneapolis, MN: University of Minnesota Press.

Agnew, J. et al (1984) *The City in Cultural Context*, New York: Unwin & Hyman.

Alexander, C. (1965) A city is not a tree. *Archit Forum* 122 (1): 58−62.Anciano, F. and L. Piper (2018), *Democracy Disconnected. Participation and Governance in a City of the South*, London and New York: Routledge.

Barabasi, A-L. (2003) *Linked. How Everything Is Connected To Evertyhing Else And What It Means For Business, Science And Everyday Life*, New York: Penguin.

Batty, M. (2008) Cities as Complex Systems: Scaling, Interaction, Networks, Dynamics and Urban Morphologies, UCL Working Papers Series, Paper 131, February.

Beauregard, R. A. (2015) *Planning Matter. Acting With Things*, Chicago: University of Chicago Press.

Beauregard, R. and L. Lieto (2016) Can Actor Network Theory Provide a Theory of Action? Planning in New York, USA, Chapter 10 in Rydin, Y and L. Tate, eds. (2016) *Actor Networks of Planning: Exploring the Influence of Actor Network Theory*, London: Routledge.

Berger, P. L. and T. Luckmann (1966) *The Social Construction of Reality. A Treatise in the Sociology of Knowledge*, Garden City, NY: Anchor Books.

Bhabha, H. (1994) *The Location of Culture*, New York: Routledge.

Bunge, M. (2014) *Emergence and Convergence. Qualitative Novelty and the Unity of Knowledge*, Toronto: University of Toronto Press.

Castells, M. (2009 [1996]) *The Rise of the Network Society*, London: Wiley Blackwell (2nd edition).

CURS, Centre for Urban and Regional Studies (2008) Digital Tools in Participatory Planning, Centre for Urban and Regional Studies Publications, Aalto.

Davis, D. (2015) From Risk to Resilience and Back: New Design Assemblages for Confronting Unknown Future, *Topos, Garten + Landschaft*, June 2015: 57-59.

De Certeau, M. (1984 [1980]) *The Practice of Everyday Life*. Berkeley and Los Angeles: University of California Press.

Vol. 5, No.02; 2021

ISSN: 2456-7760

Del Cerro Santamaría, G. (2020) Possibilities and Challenges of Intercultural Research in Global Urbanism, in *Examining Cultural Perspectives in a Globalized World*, edited by Richard Brunet-Thornton, Palgrave Macmillan, 2020

Del Cerro Santamaría, G. (2017) Iconic Megaprojects in Global Context. Revisiting Bilbao, Chapter 22 in *The Oxford Handbook of Megaproject Management*, edited by Bent Flyvbjerg, Oxford University Press.

Del Cerro Santamaría, G. and Davis D., (2011) Global City, Sage Encyclopedia Of Urban Studies.

Del Cerro Santamaría, G. (2007) *Bilbao. Basque Pathways to Globalization*, London: Elsevier.

Deleuze, G. and F. Guattari (1987) *A Thousand Plateaus. Capitalism and Schizophrenia*, Minneapolis, MN: University of Minnesota Press.

Elmqvist, T. et al eds. (2018) *Urban Planet. Knowledge Toward Sustainable Cities*, New York: Cambridge University Press.

Ernstson, H. and S. Sörlin eds. (2019) *Grounding Urban Natures. Histories and Futures of Urban Ecologies*, Cambridge, MA: The MIT Press.

Farías, I. and T. Bender, eds. (2010) *Urban Assemblages. How Actor-Network Theory Changes Urban Studies*, London: Routledge.

Forman, R. T. T. (2019) *Towns, Ecology and the Land*, New York: Cambridge University Press.

Friedmann, J. (2005) Planning Cultures in Transition, in Sanyal, B. ed. (2005) Comparative Planning Cultures, New York and London: Routledge.

Gibson, J. J. (1979) *The Ecological Approach to Visual Perception*. Boston: Houghton Mifflin; Lieto, L. and R. A. Beauregard, eds. (2016) *Planning for a Material World*, London: Routledge.

Gruber, T. (2008) Collective Knowledge Systems: Where the Social Web meets the Semantic Web, Web Semantics: Science, Services and Agents on the World Wide Web 6 (1), February, p. 2.

Guerin, C. (2013) Rhizomatic research cultures, writing groups and academic researcher identities. *International Journal of Doctoral Studies, 8,* 137-150.

Healey, P. (2013) Circuits of Knowledge and Techniques: The Transnational Flow of Planning Ideas and Practices, International Journal of Urban and Regional Research, 37 (5), 1510-1526, September.

Healey, P. (2007) Urban Complexity and Spatial Strategies. Towards a Relational Planning for Our Times, London: Routledge.

Hersperger, A. M. et al, (2018) Urban land use change: the role of strategic spatial planning, Global Environmental Change, 52, 32-42, July.

Jacobs, J. (2000) *The Nature of Economies*, New York: Modern Library.

Jullien, F. (2001) *Un sabio no tiene ideas* (*A Wise Man Does Not Have Ideas*), Spanish Edition, Madrid: Siruela.

Vol. 5, No.02; 2021

ISSN: 2456-7760

King, A. (2015) *Urbanism, Colonialism and the World Economy*, London: Routledge.

Knorr Cetina, K. (1999) *Epistemic Cultures. How the Sciences Make Knowledge*, Cambridge, MA: Harvard University Press.

Latour, B. (1987) *Science in Action. How to Follow Scientists and Engineers Through Society*, Cambridge, MA: Harvard University Press.

Latour, B. (1993) *We Have Never Been Modern*, Cambridge, MA: Harvard University Press.

Lieto, L. and R. A. Beauregard, eds. (2016) *Planning for a Material World*, London: Routledge.

Luhmann, N. (2012) *Introduction to Systems Theory*, London: Polity.

Mehaffy, M. and N. Salingaros (2015) *Design for a Living Planet. Settlement, Science and the Human Future*, London: Sustasis Foundation.

Miller, J. (2016) *A Crude Look at the Whole. The Science of Complex Systems in Business, Life and Society*, New York: Basic Books.

Morin, E. (1999) *Seven Complex Lessons in Education for the Future*, Paris: UNESCO.

Morin, E. (2008) *On Complexity*, New York: Hampton Press.

Morton, T. (2019) *Being Ecological*, Cambridge, MA: The MIT Press.

Mostafavi, M. and G. Doherty eds. (2017) *Ecological Urbanism*, Revised Ed., Harvard GSD: Lars Müller Publishers.

Müller, M. (2015) Assemblages and Actor-networks: Rethinking Socio-material Power, Politics and Space, Geography Compass 9 (1), 27-41.

Nordhaus, W. (2013) *The Climate Casino: Risk, Uncertainty, and Economics for a Warming World*, New Haven, CT: Yale University Press.

Pasquier, F. and B. Nicolescu (2019) To be or Not to be Transdisciplinary, That is the New Question. So, How to be Transdisciplinary? Transdisciplinary Journal of Engineering and Science, Vol. 10, 1-8.

Perry, B. (2002) The future of urban sociology: report of joint sessions of the British and American Sociological Associations, International Journal of Urban and Regional Research 26 (4): 844-853, December.

Rajesh, K. (2009) Participatory Institutions and People's Practices in India: An analysis of Decentralisation experiences in Kerala State, Institute for Social and Economic Change, Bangalore, June.

Robertson, R. (1995) Glocalization: Time-Space and Homogeneity-Heterogeneity, in Featherstone, M., Lash, S. and Robertson, R., eds., *Global Modernities*, Sage Publications, London, 25-44.

Sanyal, B. ed. (2005) *Comparative Planning Cultures*, New York and London: Routledge.

Sennett, R. (1992), *The Conscience of the Eye. The Design and Social Life of Cities*, New York: W. W. Norton.

Shweder, R. (2003) Who Owns Native Culture?: The Gatekeepers, *The New York Times*, September 14th, 13.

Vol. 5, No.02; 2021

ISSN: 2456-7760

Sklair, L. (2017) *The Icon Project. Architecture, Cities and Capitalist Globalization*, New York: Oxford University Press.

Sklair, L. (2018) From the Anthropocene to the Anthropo-Scene, https://blogs.lse.ac.uk/lsereviewofbooks/2018/08/02/long-read-review-from-the-anthropocene-to-the-anthropo-scene-by-leslie-sklair/

Smith, M. P. (2005) Transnational Urbanism Revisited, Journal of Ethnic and Migration Studies 31 (2), March.

Sorkin, M. (2018) W*hat Goes Up: The Right and Wrongs to the City*, London: Verso.

Stern, N. (2015) *Why Are We Waiting? The Logic, Urgency, and Promise of Tackling Climate Change*, Cambridge, MA: The MIT Press.

Stevens, G. (2002) *The Favored Circle. The Social Foundations of Architectural Distinction*, Cambridge, MA: The MIT Press.

Tafuri, M. (1979) *Architecture and Utopia. Design and Capitalist Development*, Cambridge, MA: The MIT Press.

Taylor, P. (2005) *Unruly Complexity. Ecology, Interpretation, Engagement*, Chicago, Il: University of Chicago Press.

USAID (2008), Preparation of Local Area Plans: Pilot project for Delhi, India, The Commuities Group International (TCGI) in partnersip with AECOM, April.

Von Bertalanffy, L. (1981) *A Systems View of Man: Collected Essays*, editor Paul A. LaViolette, Boulder, CO: West view Press.

Wallerstein, I. (2013) The Itinerary of World-Systems Analysis; or, How to Resist Becoming a Theory, Chapter IV in Wallerstein et al, *Uncertain Worlds*, Boulder, CO: Paradigm Publishers.

Whitehead, A. N. (1920) *The Concept of Nature*, Cambridge: Cambridge University Press, cited in Latour, B. (2016) *Facing Gaia. Eight Lectures on the New Climatic Regime*, London: Polity, p. 85.

Wiener, N. (1964) *Selected Papers of Norbert Wiener*, Cambridge, MA: MIT Press & SIAM.