Simplicity and Complexity in Cities and Their Planning

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Abstract

What are the contemporary conditions of complexity and simplicity, and their contestation the context of urban sustainability? The objective of this paper is to critically ex range of contemporary efforts that creatively engage these issues as we c transform the urban experience in the 21st century. A fundamental hypothesis theoretically, based on a preliminary synthesis of the laws of thermodynamics dynamics, and socio-econo-political theory. The hypothesis is that the more si the less complex a system, the more sustainable it is. This hypothesis accelerating degrees of complexity of societies in a global era is a key drive is coupled with and indeed underlies and makes possible two other factors tha often cited as the key drivers of sustainability: the increasing population an and human activities such as production, consumption, and their impacts; alon accelerating rates of change of human phenomena, so that together in combinat lead away from sustainability due to the fundamental principles of various including and especially thermodynamics and ecology.

Furthermore and more fundamentally, the degree of complexity of a system, esp dynamic human social systems of varying forms as well as ways of va scalar and temporal dimensions, underlies and gives rise to the possibility scales of magnitude of social systems such as cities, organisations, insti infrastructure networks, for example, and simultaneously gives rise to the acce of change of human processes that flow through those systems, such as the information and knowledge flows attendant to routine economic transactions o Giving rise to the possibility , in this context, means to provide the infras and administrative armatures that enable all human transactions, most often en institutions. Heidegger referred to this collective of enabling m technology (Heidegger 1977). In a global society these refer to but certainl to big data, the cloud and the numerous apps, softwares and hardwares that con ever-expanding, ever more interactive, and ever more complex constellation networks.

To the extent that this premise is true, this means that the measurable degree of human society and its social constructs and processes is fundamental to thei in an essential and ontological way. In an important way, complexity thus condi prospect of social institutions and processes being governable and sustainable,

degree. Moreover, following this logic, it is hypothesised that the degree c
inversely correlated with the degree of governability and the degree of sus
institutions and other social collectivities and their activities.

The complexity of a dynamic and living social system is based upon its abili
energy and information in order to support its growth and evolution. The more
information that is directed towards its development, the greater its degree
(Schneider and Sagan 2005). However, if this energy is not produced and ut
sustainable way, as much energy is nowadays, then it leads the system that uses
away from sustainability. Much the same can be indicated for information, whic
to both the development of the system – norms, rules, data, knowledge –
management and control. However, information gathering and processing consu
great deal of energy, and in increasing amounts. In this manner, complexity
and underlies the increases in scale and rates of change of a system; rath
alongside the latter two as co-equals. Furthermore, according to this view, c
not mere increases in scale and rates of change, is more fundamentally respon
current state of human affairs and their increasingly unsustainable and ungover
Increases complexity are demonstrably less and less capable of being mana
controlled by existing mechanisms and institutions as currently constituted, a
key driver away from sustainability today.

The paper continues below with an exposition of this argument and ends with c
analytical remarks that suggest several new lines of research regarding the i
complex and simple components and aspects of eco-socio-technical systems are pr
for the development of planning practice and its theory. These lines are yet to
at the time of this writing.

Background and Literature Review: Social science perspectives on complexity,
increasing, are still limited in scope and quantity, relative to natural scienc
management, where there are more (May 1973, Batty 2007, Berkes, et al. 2003, U
Porter 2012, de Roo et al. 2012). There is even less scholarship on the notion
(Elgin 1993, Miller 1993, Etzioni 2004, Maeda 2006). Scholarship on their inte
virtually non-existent (Gell-Mann 1993). In the realm of the city, these inter
almost unexplored in urban planning and social science (Portugali 2011, de Roo e
These gaps have critical consequences. The most critical of these gaps is
increasing complexity of urban society and our inability to manage it and its c
largely and silently responsible for our current predicament.

However, in contrast, complexity is acknowledged as not only the overarching contemporary times, but it is even celebrated, sought, and planned. Ever larg complex socio-technical systems are evident in corporate and government institu and infrastructural mega-projects, big data and telecomm networks, and the the necessary for deep explorations of space, oceans, and particulate matter, or ex most apparent manifestation may be the city itself. In the realm of human se size of urban agglomerations is exploding, leading to an increasing variety of label mega agglomerations, such as the megalopolis and the mega-city region (Ne Hull 2011). The overall urban population of the planet is also increasing, b and relative / proportional terms. The overlapping and interlacing multiple ne economies, infrastructures and the other characteristics of urban life inters expanding complexity that increasingly spins out of control. In so doing, w that the largely negative (on aggregate) indicators of social, health, environm and political well-being abounding mark its mark our collective desc complexity to chaos. This is due to the fact that we have not been able complexity we have unleashed, but rather merely marvel at its portent.

Complexity, it appears, is difficult to manage because it is emergent, evolvin contemporary society without precedents in type, form, scale, and its rate of c metropolitan areas, and city regions are recognized as increasingly difficult t fully ungovernable (citation). This is because increases in complexity require and sophisticated data, management, and resources, not the least of which are technology. This unintended consequence of complexity, the need for more infor energy to attempt to control it, is itself extraordinarily energy intensi International 2012). This leads to increasing consumption of energy and other support management and governance infrastructures, and the people that are en those activities. Is urban planning and governance up to the challenges?

In policy arenas, including its scholarship, the role of complexity is inex whereas neoliberalism, globalisation, climate change, terrorism, etc. are pinp usual suspects in the court of responsibility for our current predicament as networked world. [insert a section here regarding the inter-relationship betw and these global predicaments] Underlying these conditions which I hav predicaments is the premise that at least part of the reason for which they traced to a complexity that extends not only beyond our capacity to cope and t the organizational, urban and societal scales; but it extends more crucial personal or individual abilities to understand and thus to navigate in order to and give meaning to our lives, and how to go about making them more meaning

sustainable in the future. In this context we begin to see that while simplic complexity lauded, these stances mask fundamental insights that have im consequences for society and fundamental relevance for the future.

Exposition of the Argument: An underlying premise of the paper is that what li complexity and simplicity with sustainability are their differences. Simple s have fewer parts. They tend to be smaller, have fewer interactions, follow phys be more predictable and more reliable. Complex systems tend to have more parts. systems tend to be larger, have more interactions, follow natural as well as ph dissipative, emergent, and thus less predictable and reliable. When the com system exceeds a set of limits that cannot be pre-determined, and cannot be ma the system itself (that is, the system cannot be self-organised), then it will its self-governance capacity as well as surpass the capacity of its environs. instability, and over the longer run, crisis. Here crisis means the inabilit change sufficiently to respond to altering conditions and perturbations in orde itself sustainably. When a system loses its ability to reproduce itself, it go outcome of a true crisis is the demise of the system, or its radical transforma type of system.

The rates at which these phenomena occur highlight the importance of understan as processes (Neuman and Churchill, 2011). Natural ecosystems, for example, are and their complexity evolves in dynamic equilibrium over the long run via ad other natural mechanisms the inescapable laws of nature. One key fact distinguishes natural ecosystems from human ones (cities, societies) is the ra of these mechanisms and processes. These rates of change are gradual, they naturally in a trial and error sequence of adaptation to surroundings and circ biologists call evolution. Moreover, these rates of change in the natural worl at least, are sustainable ones. As such, these rates of change and processes (adaptation, evolution) should inform current debates about urban progress, eco politics.

However, complex social systems including institutions, cities, societies, nati and so on; are subject to fluxes in conditions that are not necessarily only ev are also punctuated events and phenomena that lead to catastrophe such as respond to catastrophe, such as famine or draught. While learning and progres these circumstances, more often than not these catastrophic events reveal that conditions of human society are not sustainable, equitable, and respectful o other beings basic rights. [transition section here from the importance of th

to the nature of management and governance being linear, rational and thus hamst
capacity to respond to complexity, chaos, and catastrophes.]

Another key factor that distinguishes complexity from simplicity and complex s
simple systems is that the degree of complexity in nature is managed via evolut
to exceed its capacity, while in urban society complexity has been managed la
rational, linear tools that cope poorly with interdependencies among a multipli
and with their dynamic uncertainties. The latter factors that complicate matt
magnified by the accelerating rates of change and scales of impacts. The i
among all these factors give rise to degrees of complexity that lie beyond
capacities to understand, much less manage, these processes and their outcon
impacts.

Yet we rush headlong into more complexity due to the thrills, the convenience
productivity increases it affords. Think of the cloud, digital games, films,
media creations, and an endless list of other gadgets and capabilities. The
conveniences that occur throughout the city are enabled and put into place
complexity: international trade, globalisation, and elaborate governance and a
apparatus attendant to the global political economy. At what costs, to
communities, societies, other species and planet does Are we rush ourselves making
blindly into this rush, with deficient decision mechanisms (Kahneman 2011)?

Compounding this complexity is parallel and increasingly intertwined dual worl
virtual, with prospects unknown and unknowable. The outcomes spinning from real
virtual reality and their interactions defy nature as they draw us in deep
humanity from the grounding of nature. Within urban society we are increasingl
computer-generated algorithms we do not control, or think we control, while the
spins consequences and implications we can scarcely imagine, much less control.

In this context, people increasingly opt out , move away from the big city, a
of means in order to simplify, cope, and survive. They adopt and adapt a mu
strategies in order to navigate the complex urban realm (de Certeau 1984).

The remainder of the full paper will address the intersection between sim
complexity by addressing two aspects. First is a brief critical history, explo
which themes of complexity and simplicity have been mobilized both as concep
political economy agendas in cities. Second is a preliminary mapping of co

responses. Key questions in the analysis of the intersection between simpli
complexity include: Are societies destined to collapse due to their unstoppabl
towards ever-increasing complexity (Tainter 1988)? Is simplicity the only pa
sustainable survival? (Alexander and McLeod 2014) Are there intermediate ways?

Conclusion in abstract form: exploratory research seeks to make new sense of th
continuing and seemingly intractable conundrum of the consumer urban society
policies that enable it in the urban context. It will also target the key i
existing political economy arrangements guiding urban planning and governance
advantage of the opportunities in the twenty-first century, or are new norm
necessary? In sum, the paper will have engaged the intertwined issues of sim
complexity, as well as their implications, in order to draw conclusions that are
especially in the urban governance context.

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